U

YAMAHA

HTR-5490

AV Receiver

IMPORTANT

Please record the serial number of this unit in the space below.

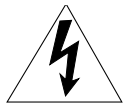
MODEL:

Serial No.:

The serial number is located on the rear of the unit. Retain this Owner's Manual in a safe place for future reference.

OWNER'S MANUAL

SAFETY INSTRUCTIONS

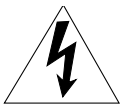


CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

- Explanation of Graphical Symbols



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

1 Read Instructions – All the safety and operating instructions should be read before the product is operated.

2 Retain Instructions – The safety and operating instructions should be retained for future reference.

3 Heed Warnings – All warnings on the product and in the operating instructions should be adhered to.

4 Follow Instructions – All operating and use instructions should be followed.

5 Cleaning – Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

6 Attachments – Do not use attachments not recommended by the product manufacturer as they may cause hazards.

7 Water and Moisture – Do not use this product near water – for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.

8 Accessories – Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

9 A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

10 Ventilation – Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

11 Power Sources – This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

12 Grounding or Polarization – This product may be equipped with a polarized alternating current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

13 Power-Cord Protection – Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

14 Lighting – For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.

15 Power Lines – An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

16 Overloading – Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

17 Object and Liquid Entry – Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

18 Servicing – Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

19 Damage Requiring Service – Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a) When the power-supply cord or plug is damaged,
b) If liquid has been spilled, or objects have fallen into the product,
c) If the product has been exposed to rain or water,

d) If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation,

e) If the product has been dropped or damaged in any way, and

f) When the product exhibits a distinct change in performance - this indicates a need for service.

20 Replacement Parts – When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

21 Safety Check – Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

22 Wall or Ceiling Mounting – The unit should be mounted to a wall or ceiling only as recommended by the manufacturer.

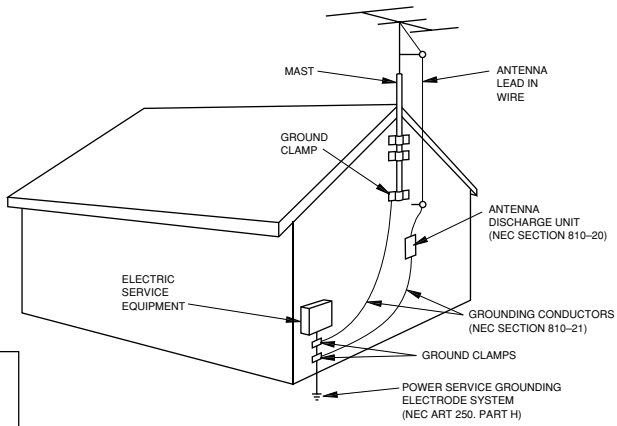
23 Heat – The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

Note to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

24 Outdoor Antenna Grounding – If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

EXAMPLE OF ANTENNA GROUNDING


MAST
ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810–20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810–21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250. PART H)

NEC – NATIONAL ELECTRICAL CODE

FCC INFORMATION (for US customers only)

1. IMPORTANT NOTICE : DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

2. IMPORTANT : When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

3. NOTE : This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices.

This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices.

Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

Relocate either this product or the device that is being affected by the interference.

Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s.

In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable.

If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Electronics Corp., U.S.A. 6660 Orangethorpe Ave, Buena Park, CA 90620.

The above statements apply ONLY to those products distributed by Yamaha Corporation of America or its subsidiaries.

CAUTION: READ THIS BEFORE OPERATING YOUR UNIT.

1 **To assure the finest performance, please read this manual carefully. Keep it in a safe place for future reference.**

2 **Install this unit in a well ventilated, cool, dry, clean place with at least 30 cm on the top, and 20 cm on the right and left, and at the back of this unit — away from direct sunlight, heat sources, vibration, dust, moisture, and/or cold.**

3 **Locate this unit away from other electrical appliances, motors, or transformers to avoid humming sounds. To prevent fire or electrical shock, do not place this unit where it may get exposed to rain, water, and/or any type of liquid.**

4 **Do not expose this unit to sudden temperature changes from cold to hot, and do not locate this unit in a environment with high humidity (i.e. a room with a humidifier) to prevent condensation inside this unit, which may cause an electrical shock, fire, damage to this unit, and/or personal injury.**

5 **On the top of this unit, do not place:**
- **– Other components, as they may cause damage and/or discoloration on the surface of this unit.**
- **– Buring objects (i.e. candles), as they may cause fire, damage to this unit, and/or personal injury.**
- **– Containers with liquid in them, as they may cause electrical shock to the user and/or damage to this unit.**

6 **Do not cover this unit with a newspaper, tablecloth, curtain, etc. in order not to obstruct heat radiation. If the temperature inside this unit rises, it may cause fire, damage to this unit, and/or personal injury.**

7 **Do not plug in this unit to a wall outlet until all connections are complete.**

8 **Do not operate this unit upside-down. It may overheat, possibly causing damage.**

9 **Do not use force on switches, knobs and/or cords.**

10 **When disconnecting the power cord from the wall outlet, grasp the plug; do not pull the cord.**

11 **Do not clean this unit with chemical solvents; this might damage the finish. Use a clean, dry cloth.**

12 **Only voltage specified on this unit must be used. Using this unit with a higher voltage than specified is dangerous and may cause fire, damage to this unit, and/or personal injury. YAMAHA will not be held responsible for any damage resulting from use of this unit with a voltage other than specified.**

13 **To prevent damage by lightning, disconnect the power cord from the wall outlet during an electrical storm.**

14 **Take care of this unit so that no foreign objects and/or liquid drops inside this unit.**

15 **Do not attempt to modify or fix this unit. Contact qualified YAMAHA service personnel when any service is needed. The cabinet should never be opened for any reasons.**

16 **When not planning to use this unit for long periods of time (i.e. vacation), disconnect the AC power plug from the wall outlet.**

17 **Be sure to read the "TROUBLESHOOTING" section on common operating errors before concluding that this unit is faulty.**

18 **Before moving this unit, press STANDBY/ON to set this unit in the standby mode, and disconnect the AC power plug from the wall outlet.**

19 **VOLTAGE SELECTOR (China model only)**
The VOLTAGE SELECTOR on the rear panel of this unit must be set for your local main voltage BEFORE plugging into the AC main supply. Voltages are 110/120/220/240 V AC, 50/60 Hz.

This unit is not disconnected from the AC power source as long as it is connected to the wall outlet, even if this unit itself is turned off. This state is called the standby mode. In this state, this unit is designed to consume a very small quantity of power.

FOR CANADIAN CUSTOMERS

To prevent electric shock, match wide blade of plug to wide slot and fully insert.
This Class B digital apparatus complies with Canadian ICES-003.

We Want You Listening For A Lifetime

YAMAHA and the Electronic Industries Association's Consumer Electronics Group want you to get the most out of your equipment by playing it at a safe level. One that lets the sound come through loud and clear without annoying blaring or distortion – and, most importantly, without affecting your sensitive hearing.

Since hearing damage from loud sounds is often undetectable until it is too late, YAMAHA and the Electronic Industries Association's Consumer Electronics Group recommend you to avoid prolonged exposure from excessive volume levels.

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FEATURES

Built-in 6-Channel Power Amplifier

◆ Minimum RMS Output Power
(0.04% THD, 20 Hz – 20 kHz, 8Ω)

Main:	80 W + 80 W
Center:	80 W
Rear:	80 W + 80 W
Rear center:	80 W

Multi-Mode Digital Sound Field Processing

◆ Dolby Pro Logic/Dolby Pro Logic II Decoder
◆ Dolby Digital/Dolby Digital Matrix 6.1 Decoder
◆ DTS/DTS ES Matrix 6.1, Discrete 6.1, DTS Neo: 6 Decoder
◆ CINEMA DSP: Combination of YAMAHA DSP Technology and Dolby Pro Logic, Dolby Digital or DTS
◆ Virtual CINEMA DSP
◆ SILENT CINEMA DSP

Sophisticated AM/FM Tuner

◆ 40-Station Random Access Preset Tuning
◆ Automatic Preset Tuning
◆ Preset Station Shifting Capability (Preset Editing)

Other Features

◆ 96-kHz/24-bit D/A Converter
◆ "SET MENU" which Provides You with 14 Items for Optimizing This Unit for Your Audio/Video System
◆ Test Tone Generator for Easier Speaker Balance Adjustment
◆ 6-Channel External Decoder Input for Other Future Formats
◆ BASS EXTENSION Button for Reinforcing Bass Response
◆ On Screen Display Function Helpful in Controlling This Unit
◆ S Video Signal Input/Output Capability
◆ Component Video Input/Output Capability
◆ Optical and Coaxial Digital Audio Signal Jacks
◆ Sleep Timer
◆ Remote Control with Preset Manufacturer Codes and "Learning" Capability
◆ PROCESSOR DIRECT for no alteration of the original signal

• indicates a tip for your operation.
• Some operations can be performed by using either the buttons on the main unit or on the remote control. In cases when the button names differ between the main unit and the remote control, the button name on the remote control is given in parentheses in this manual.

Manufactured under license from Dolby Laboratories.

"Dolby", "Pro Logic", and the double-D symbol are trademarks of Dolby Laboratories.

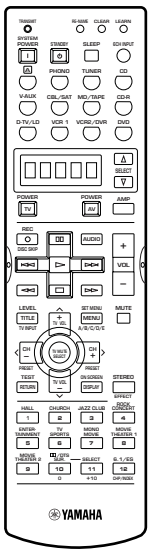
"DTS", "DTS-ES Extended Surround" and "Neo: 6" are trademarks of Digital Theater System, Inc.

GETTING STARTED

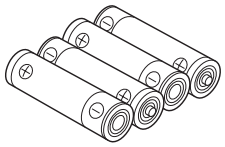
Checking the Package Contents

Check your package to make sure it has the following items.

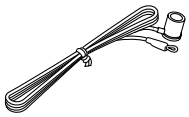
Remote control



Batteries (4) (AAA, R03, UM-4)

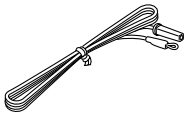


Indoor FM antenna (U.S.A., Canada and China models)

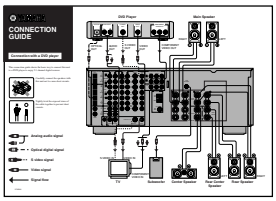


AM loop antenna

(Australia model)

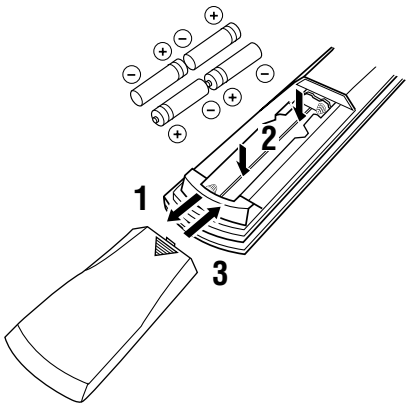


Connection Guide



Installing Batteries in the Remote Control

Insert the batteries in the correct direction by aligning the + and – marks on the batteries with the polarity markings (+ and –) inside the battery compartment.



1 **Press the ▼ part and slide the battery compartment cover off.**

2 **Insert four supplied batteries (AAA, R03, UM-4) according to the polarity markings on the inside of the battery compartment.**

3 **Slide the cover back until it snaps into place.**

■ Notes on batteries

- Change the batteries periodically.
- Do not use old batteries together with new ones.
- Do not use different types of batteries (such as alkaline and manganese batteries) together. Read the packaging carefully as these different types of batteries may have the same shape and color.

■ Changing batteries

As the batteries lose power, the operating range of the remote control decreases and the indicator does not flash or its light becomes dim. When you notice any of these conditions, change all of the batteries.

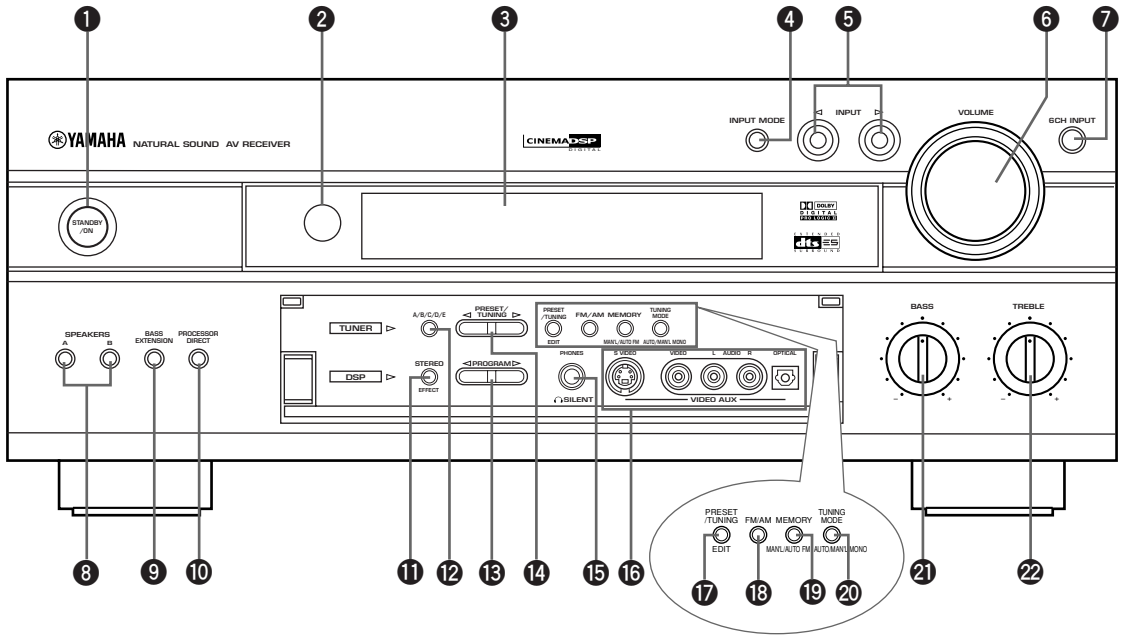
If the remote control is without batteries for more than 2 minutes, or if exhausted batteries remain in the remote control, the contents of the memory may be cleared. When the memory is cleared, insert new batteries, set up the manufacturer code and program any acquired functions that may have been cleared.

Note

- If the batteries have leaked, dispose of them immediately. Avoid touching the leaked material or letting it come into contact with clothing, etc. Clean the battery compartment thoroughly before installing new batteries.

CONTROLS AND FUNCTIONS

Front Panel



❶ STANDBY/ON

Turns on and sets this unit in the standby mode. When you turn on this unit, you will hear a click and there will be a 4 to 5-second delay before this unit can reproduce sound.

Standby mode
In this mode, this unit consumes a small amount of power to receive infrared-signals from the remote control.

❷ Remote control sensor

Receives signals from the remote control.

❸ Front panel display

Shows information about the operational status of this unit (see page 8).

❹ INPUT MODE

Sets the priority for the types of input signals (AUTO, DTS, ANALOG) to receive when one component is connected to two or more input jacks of this unit (see page 27). Priority cannot be set when 6CH INPUT is selected as the input source.

❺ INPUT ⊲ / ⊳

Selects the input source you want to listen to or watch.

❻ VOLUME

Controls the output level of all audio channels. This does not affect the REC OUT level.

❼ 6CH INPUT

Selects the source connected to the 6CH INPUT jacks. The source selected by pressing 6CH INPUT takes priority over the source selected with INPUT ⊲ / ⊳ (or the input selector buttons on the remote control).

❽ SPEAKERS A/B

Turn on or off the set of main speakers connected to the A and/or B terminals on the rear panel at each time its corresponding button is pressed.

❾ BASS EXTENSION

Turns on or off the BASS EXTENSION function at each time the button is pressed, this feature boosts the bass frequency of the left and right main channels by +6 dB (60 Hz) while maintaining overall tonal balance. This boost is useful if you do not use a subwoofer. However, this boost may not be noticeable if "1B MAIN SP" on the SET MENU is set to SMALL and "1E LFE/ BASS OUT" is set to SWFR.

❿ PROCESSOR DIRECT

Turns on or off the PROCESSOR DIRECT function at each time the button is pressed. When this is on, BASS, TREBLE, and BASS EXTENSION are bypassed, eliminating any alteration of the original signal.

⓫ STEREO/EFFECT
Switches the normal stereo or DSP effect reproduction. When STEREO is selected, 2-channel input signals are directed to the main left and right speakers without effect sounds. All Dolby Digital and DTS audio signals except for the LFE channel are mixed down to the main left and right speakers.

⓬ A/B/C/D/E
Selects one of the 5 preset station groups (A to E).

⓭ PROGRAM ◁ / ▷
Selects the DSP program (see page 28).

⓮ PRESET/TUNING ◁ / ▷
Selects preset station number 1 to 8 when the colon (:) appears next to the band indication on the front panel display, and selects the tuning frequency when the colon (:) does not appear.

⓯ PHONES jack
Outputs audio signals for private listening with headphones. When you connect headphones, no signals are output to the OUTPUT jacks or to the speakers.

⓰ VIDEO AUX jacks
Inputs audio and video signals from a portable external source such as a game console. To reproduce source signals from these jacks, select V-AUX as the input source.

⓱ PRESET/TUNING EDIT
Switches the function of PRESET/TUNING ◁ / ▷ (the colon (:) turns on or off) between selecting a preset station number and tuning.
This button is also used to exchange the assignment of two preset stations with each other.

⓲ FM/AM
Switches the reception band between FM and AM.

⓳ MEMORY (MAN'L/AUTO FM)
Stores a station in the memory. Hold down this button for more than 3 seconds to start automatic preset tuning.

⓴ TUNING MODE (AUTO/MAN'L MONO)
Switches the tuning mode between automatic and manual. To select the automatic tuning mode, press this button so that the "AUTO" indicator lights up on the front panel display. To select the manual tuning mode, press this button so that the "AUTO" indicator does not light up.

㉑ BASS
Adjusts the low-frequency response for the left and right main channels.
Turn the control to the right to increase or to the left to decrease the low-frequency response.

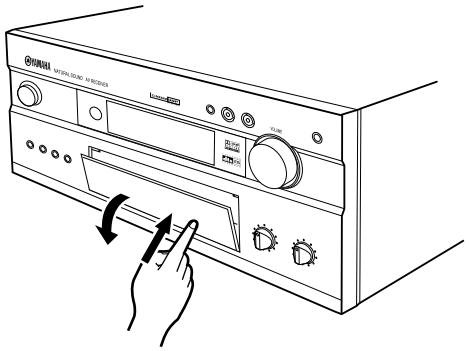
㉒ TREBLE
Adjusts the high-frequency response for the left and right main channels.
Turn the control to the right to increase or to the left to decrease the high-frequency response.

Note

- If you increase or decrease the high-frequency or the low-frequency sound to an extreme level, the tonal quality from the center and rear speakers may not match that of the left and right main speakers.

■ Opening and closing the front panel door

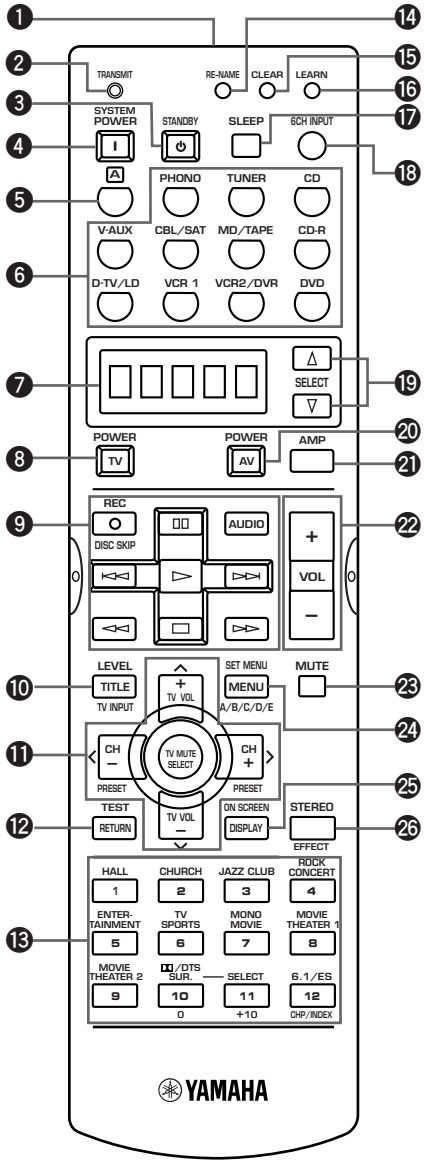
When you are not operating the controls behind the front panel door, close the door.



To open, press gently on the lower part of the panel.

Remote Control

This section describes the controls and their functions of the remote control. Make sure that the AMP mode is selected before starting operation. See "REMOTE CONTROL FEATURES" on pages 42 to 51 for operating other components with the remote control.



Words and symbols in yellow are to operate this unit.

❶ Infrared window
Outputs infrared control signals. Aim this window at the component you want to operate.

❷ TRANSMIT indicator
Flashes while the remote control is sending signals.

❸ STANDBY
Sets this unit in the standby mode.

❹ SYSTEM POWER
Turns on the power of this unit.

❺ A
Switches the control area for the extra component that is not connected to this unit without changing the input.

❻ Input selector buttons
Select the input source and change the control area.

❼ Display window
Shows the selected source component that you are controlling.

❽ TV POWER
Turns on and off the power of the TV.

❾ Operation Section
Provides functions such as play, stop, skip, etc. for operating your other components.

❿ LEVEL
Selects the effect speaker channel to be adjusted and sets the level.

⓫ Multi control section
Functions vary depending on your components that are set up with the manufacturer code.

⓬ TEST
Outputs the test tone to adjust the speaker levels.

⓭ DSP program/Numeric buttons
Select DSP programs for the AMP position or numbers for the other component positions. (Press a button repeatedly to select a DSP program within that group.)

⓮ RE-NAME
Used for changing the input source name in the display window (see page 45).

⓯ CLEAR
Used for clearing functions acquired when using the learn and rename features, and set manufacturer codes (see page 46).

⓰ LEARN
Used for setting up the manufacturer code or for programming the functions of other remote controls (see page 44).

⓱ SLEEP
Sets the sleep timer.

⓲ 6CH INPUT
Selects the source connected to the 6CH INPUT jacks.

⑲ SELECT △/▽
Selects the another component to control independently from the input that has been selected by pressing an input selector button.

⑳ AV POWER
Turns on and off the power of the component selected by the input selector button.

㉑ AMP
Selects AMP or other component selected by the input selector button.

㉒ VOL +/–
Increases or decreases the volume level.

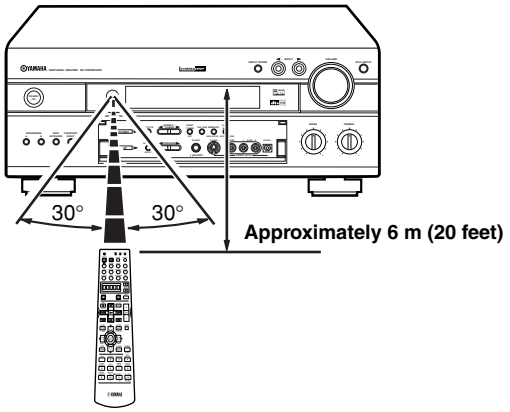
㉓ MUTE
Mutes the sound. The MUTE indicator turns on when the MUTE function is on. Press again to restore the audio output to the previous volume level.

㉔ SET MENU
Selects the SET MENU mode.

㉕ ON SCREEN
Displays the input or operation status.

㉖ STEREO/EFFECT
Switches the normal stereo or DSP effect reproduction. When STEREO is selected, 2-channel input signals are directed to the main left and right speakers without effect sounds. All Dolby Digital and DTS audio signals except for the LFE channel are also directed to the main left and right speakers.

Using the Remote Control

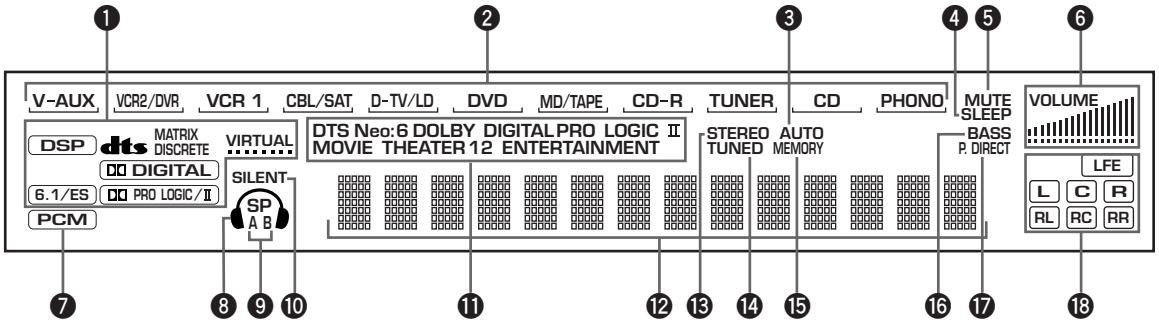


The remote control transmits a directional infrared beam. Be sure to aim the remote control directly at the remote control sensor on the main unit during operation.

■ Handling the remote control

- Do not spill water or other liquids on the remote control.
- Do not drop the remote control.
- Do not leave or store the remote control in the following types of conditions:
  – high humidity or temperature such as near a heater, stove or bath;
  – dusty places; or
  – in places subject to extremely low temperatures.

Front Panel Display



❶ Processor indicators

When any function of DSP, DTS, MTRIX DISCRETE, VIRTUAL, DIGITAL, 6.1/ES, and PRO LOGIC/II is activated, its indicator lights up.

❷ Input source indicator

Shows the current input source with underneath.

❸ AUTO indicator

Shows that this unit is in the automatic tuning mode.

❹ SLEEP indicator

Lights up while the sleep timer is on.

❺ MUTE indicator

Flashes while the MUTE function is on.

❻ VOLUME level indicator

Indicates the volume level.

❼ PCM indicator

Lights up when this unit is reproducing PCM (pulse code modulation) digital audio signals.

❽ Headphones indicator

Lights up when headphones are connected.

❾ SP A B indicator

Lights up according to which set of main speakers is selected. Both indicators light up when both sets of speakers are selected.

❿ SILENT indicator

Lights up when headphones are connected with the sound effect (see "SILENT CINEMA DSP" on page 30).

⓫ DSP program indicators

The name of the selected DSP program lights up when the ENTERTAINMENT, MOVIE THEATER 1, MOVIE THEATER 2 or DD/DTS SURROUND DSP program is selected.

⓬ Multi-information display

Shows the current DSP program name and other information when adjusting or changing settings.

⓭ STEREO indicator

Lights up when this unit is receiving a strong signal for an FM stereo broadcast while the "AUTO" indicator is lit.

⓮ TUNED indicator

Lights up when this unit tunes in to a station.

⓯ MEMORY indicator

Flashes to show a station can be stored.

⓰ BASS indicator

Lights up while BASS EXTENSION is on.

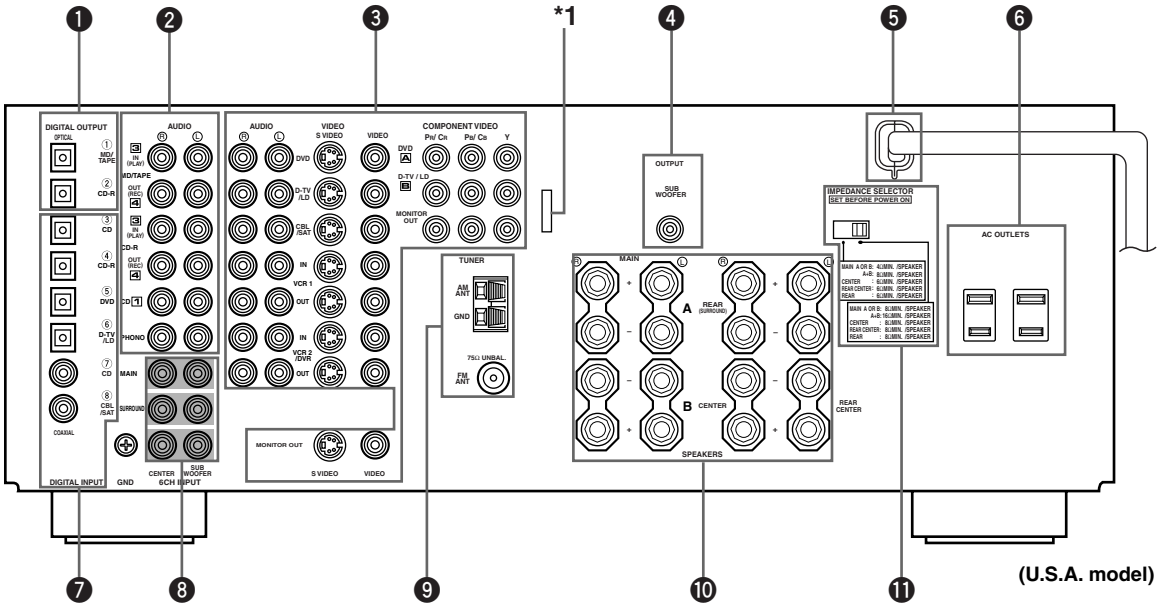
⓱ P. DIRECT

Lights up while PROCESSOR DIRECT is on.

⓲ Input channel indicator

Indicates the channel components of input signals being received.

Rear Panel



❶ DIGITAL OUTPUT jacks

❷ Audio component jacks

See pages 16 and 17 for connection information.

❸ Video component jacks

See pages 14 and 15 for connection information.

❹ SUBWOOFER jacks

See page 18 for connection information.

❺ AC power cord

Connect to a power outlet.

❻ AC OUTLET(S)

Use these outlets to supply power to your other A/V components (see page 19).

❼ DIGITAL INPUT jacks

❽ 6CH INPUT jacks

See page 18 for connection information.

❾ Antenna input terminals

See page 36 for connection information.

❿ Speaker terminals

See pages 11 and 12 for connection information.

⓫ IMPEDANCE SELECTOR switch

Use this switch to match the amplifier output to your speaker impedance (see page 36). Set this unit in the standby mode before you change the setting of this switch.

< China model only >

FREQUENCY STEP switch

See page 36.

VOLTAGE SELECTOR

See page 19.

*1 As this terminal is used for an examination in the factory, do not connect any equipment to this terminal.

SPEAKER SETUP

Speakers to Be Used

This unit has been designed to provide the best sound-field quality with a 6-speaker system, using left and right main speakers, left and right rear speakers, and a center and rear center speakers. If you use different brands of speakers (with different tonal qualities) in your system, the tone of a moving human voice and other types of sound may not shift smoothly. We recommend that you use speakers from the same manufacturer or speakers with the same tonal quality.

The main speakers are used for the main source sound plus the effect sounds. They will probably be the speakers from your present stereo system. The rear speakers are used for the effect and surround sounds, and the center speaker is for the center sounds (dialog, vocals, etc.). If for some reason it is not practical to use a center speaker, you can do without it. Best results, however, are obtained with the full system.

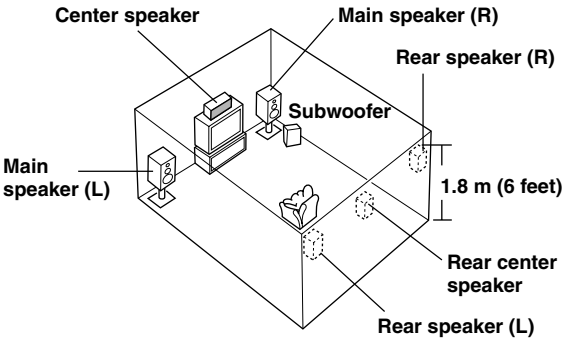
The main speakers should be high-performance models and have enough power-handling capacity to accept the maximum output of your audio system. The other speakers do not have to be equal to the main speakers. For precise sound localization, however, it is ideal to use the models of equivalent performance with the main speakers.

■ Use of a subwoofer expands your sound field

It is also possible to further expand your system with the addition of a subwoofer. The use of a subwoofer is effective not only for reinforcing bass frequencies from any or all channels, but also for reproducing the LFE (low-frequency effect) channel with high fidelity when the Dolby Digital signal or the DTS signal is played back. The YAMAHA Active Servo Processing Subwoofer System is ideal for natural and lively bass reproduction.

Speaker Placement

Refer to the following diagram when you place the speakers.



■ Main speakers

Place the left and right main speakers an equal distance from the ideal listening position. The distance of each speaker from each side of the video monitor should be the same.

■ Center speaker

Align the front face of the center speaker with the front face of your video monitor. Place the speaker as close to the monitor as possible, such as directly over or under the monitor and centrally between the main speakers.

Note

- If the center speaker is not used, the center channel sound will be heard from the left and right main speakers. In this case, "1A CENTER SP" on the SET MENU is set to NONE (see page 53 for details).

■ Rear speakers

Place these speakers behind your listening position, facing slightly inwards, nearly 1.8 m (6 feet) above the floor.

■ Rear center speaker

Place the rear center speaker in the center between the left and right rear speakers at the same height from the floor as the rear speakers.

■ Subwoofer

The position of the subwoofer is not so critical, because low bass sounds are not highly directional. But it is better to place the subwoofer near the main speakers. Turn it slightly toward the center of the room to reduce the wall reflections.

CAUTION

Use magnetically shielded speakers. If this type of speakers still creates the interference with a monitor, place the speakers away from the monitor.

Connecting the Speakers

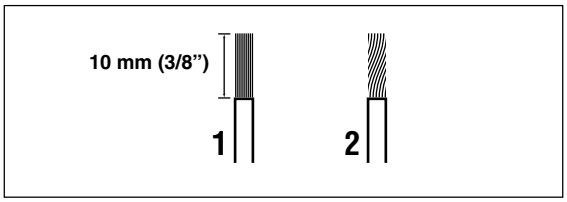
Be sure to connect the left channel (L), right channel (R), "+" (red) and "–" (black) properly. If the connections are faulty, no sound will be heard from the speakers, and if the polarity of the speaker connections is incorrect, the sound will be unnatural and lack bass.

CAUTION

- Use speakers with the specified impedance shown on the rear panel of this unit.
- Do not let the bare speaker wires touch each other and do not let them touch any metal part of this unit. This could damage this unit and/or speakers.

If necessary, use the SET MENU to change the speaker mode settings according to the number and size of the speakers in your configuration after you finish connecting your speakers.

■ Speaker cables

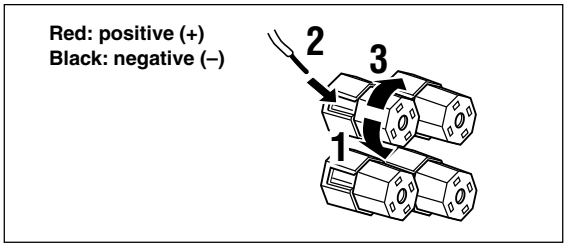


A speaker cord is actually a pair of insulated cables running side by side. One of the cables is colored or shaped differently, perhaps with a stripe, groove or ridge.

1 Remove approximately 10 mm (3/8") of insulation from each of the speaker cables.

2 Twist the exposed wires of the cable together to prevent short circuits.

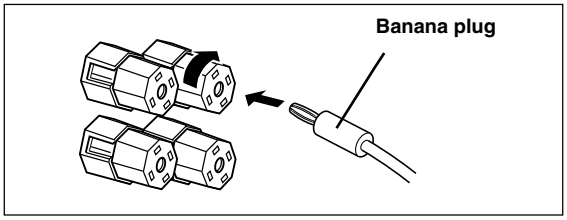
■ Connecting to the SPEAKERS terminals



1 Unscrew the knob.

2 Insert one bare wire into the hole in the side of each terminal.

3 Tighten the knob to secure the wire.



(U.S.A., Canada, Australia and China models only)

- Banana plug connections are also possible. First, tighten the knob and then insert the banana plug connector into the end of the corresponding terminal.

■ MAIN SPEAKERS terminals

One or two speaker systems can be connected to these terminals. If you use only one speaker system, connect it to either of the MAIN A or B terminals.

■ REAR SPEAKERS terminals

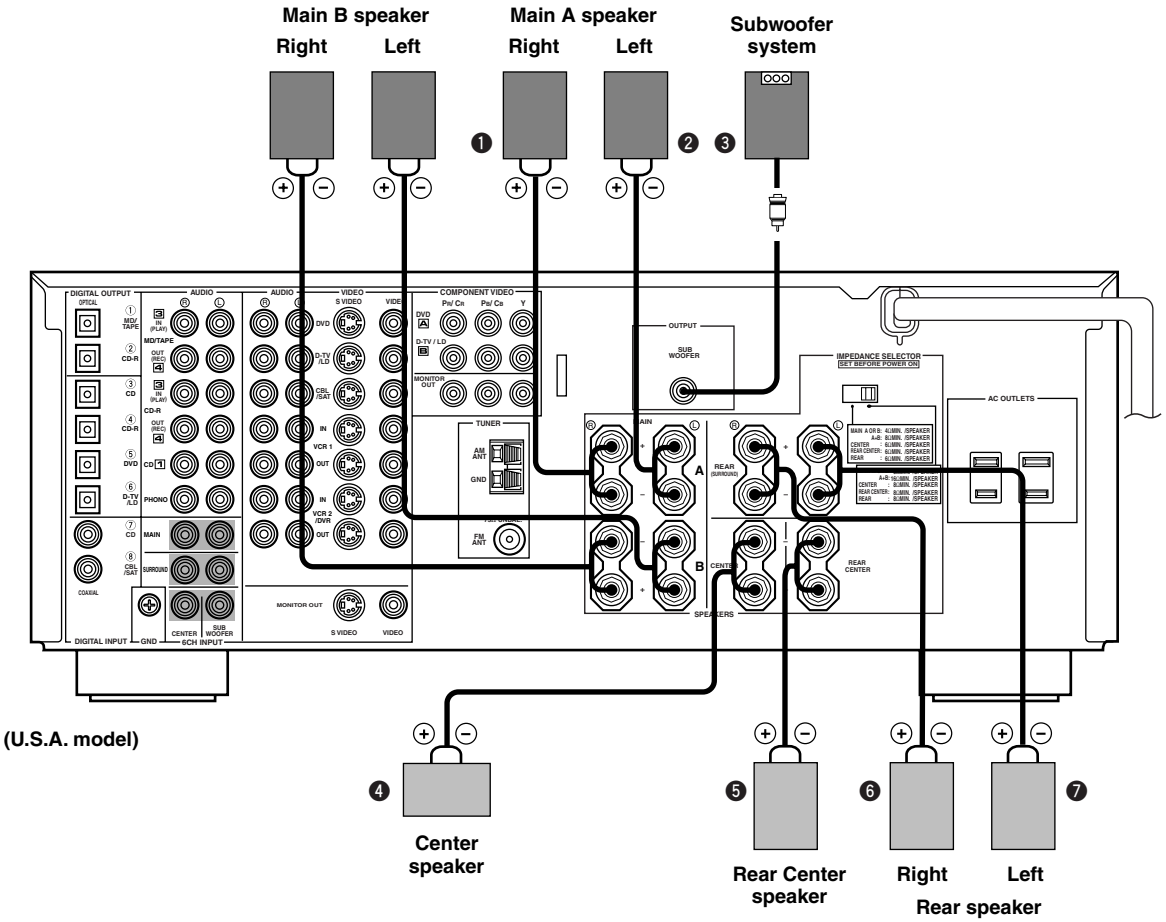
A rear speaker system can be connected to these terminals.

■ CENTER SPEAKER terminals

A center speaker can be connected to these terminals.

■ REAR CENTER SPEAKER terminals

A rear center speaker can be connected to these terminals.



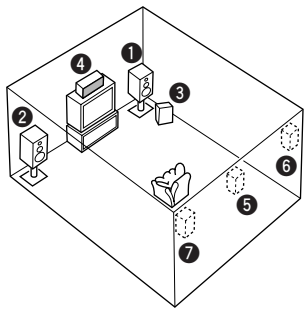
(U.S.A. model)

■ SUBWOOFER jack

When using a subwoofer with built-in amplifier, including the YAMAHA Active Servo Processing Subwoofer System, connect the input jack of the subwoofer system to this jack. Low bass signals distributed from the main, center and/or rear channels are directed to this jack if they are assigned to this jack. (The cut-off frequency of this jack is 90 Hz.) The LFE (low-frequency effect) signals generated when Dolby Digital or DTS is decoded are also directed if they are assigned to this jack.

Notes

- Adjust the volume level of the subwoofer with the control on the subwoofer. It is also possible to adjust the volume level by using the remote control of this unit (see ADJUSTING THE LEVEL OF THE EFFECT SPEAKERS on page 63).
- Depending on the settings of “1 SPEAKER SET” and “10 LFE LEVEL” on the SET MENU, some signals may not be output from the SUBWOOFER jack.



The diagram above shows the speaker layout in the listening room.

■ IMPEDANCE SELECTOR switch

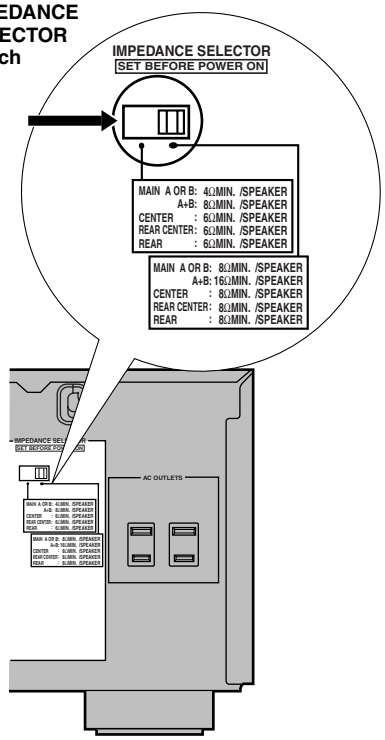
WARNING

Do not change the IMPEDANCE SELECTOR switch setting while the power of this unit is on, otherwise this unit may be damaged.

If this unit fails to turn on when STANDBY/ON (or SYSTEM POWER) is pressed, the IMPEDANCE SELECTOR switch may not be fully slid to either position. If so, slide the switch to either position fully when this unit is in the standby mode.

Select the left and right position according to the impedance of the speakers in your system. Be sure to move this switch only when this unit is in the standby mode.

IMPEDANCE SELECTOR switch



(U.S.A. model)

Switch position	Speaker	Impedance level
Left	Main	If you use one set of main speakers, the impedance of each speaker must be 4 Ω or higher. If you use two sets of main speakers, the impedance of each speaker must be 8 Ω or higher.
	Center	The impedance must be 6 Ω or higher.
	Rear Center	The impedance must be 6 Ω or higher.
	Rear	The impedance of each speaker must be 6 Ω or higher.
Right	Main	If you use one set of main speakers, the impedance of each speaker must be 8 Ω or higher. If you use two sets of main speakers, the impedance of each speaker must be 16 Ω or higher. [Canada model only] The impedance of each speaker must be 8 Ω or higher.
	Center	The impedance must be 8 Ω or higher.
	Rear Center	The impedance must be 8 Ω or higher.
	Rear	The impedance of each speaker must be 8 Ω or higher.

CONNECTIONS

Before Connecting Components

CAUTION

Never connect this unit and other components to mains power until all connections between components have been completed.

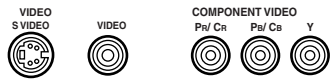
- Be sure all connections are made correctly, that is to say L (left) to L, R (right) to R, "+" to "+" and "–" to "–". Some components require different connection methods and have different jack names. Refer to the operation instructions for each component to be connected to this unit.
- When you connect other YAMAHA audio components (such as a tape deck, MD recorder and CD player or changer), connect them to the jack with the same number labels as 1, 3, 4 etc. YAMAHA applies this labeling system to all its products.
- After you have completed all connections, check them again to make sure they are correct.

Connecting Video Components

■ About the video jacks

There are three types of video jacks. Video signals input through the VIDEO jacks are the conventional composite video signals. Video signals input through the S VIDEO jacks are separated into luminance (Y) and color (C) video signals. The S-video signals achieve high-quality color reproduction. Video signals input through the COMPONENT VIDEO jacks are separated into luminance (Y) and color difference (P_B/C_B, P_R/C_R) video signals. The jacks are also separated into three for each signal. The description of the component video jacks may be different depending on the component (e.g. Y, C_B, C_R/Y, P_B, P_R/Y, B-Y, R-Y etc.). Component video signals provide the best quality in picture reproduction.

If your video component has an S-video output or component video output, you can connect it to this unit. Connect the S-video signal output jack on your video component to the S VIDEO jack or connect the component signal output jacks on your video component to the COMPONENT VIDEO jacks.



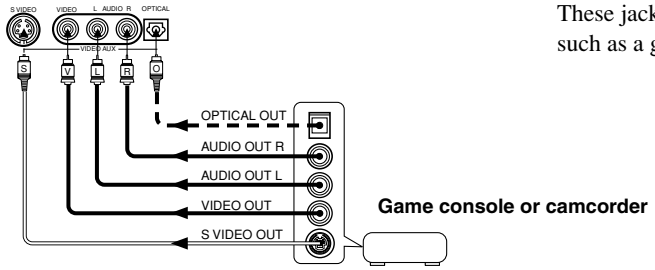
S VIDEO jack **VIDEO jack (composite)** **COMPONENT VIDEO jacks**

- Each type of video jack works independently. Signals input through the composite video, S-video and component jacks are output through the corresponding composite video, S-video, and component jacks, respectively.
- You can designate the input for the COMPONENT VIDEO A and B jacks according to your component by using "7 I/O ASSIGNMENT" on the SET MENU (see pages 58 and 59 for details).

Notes

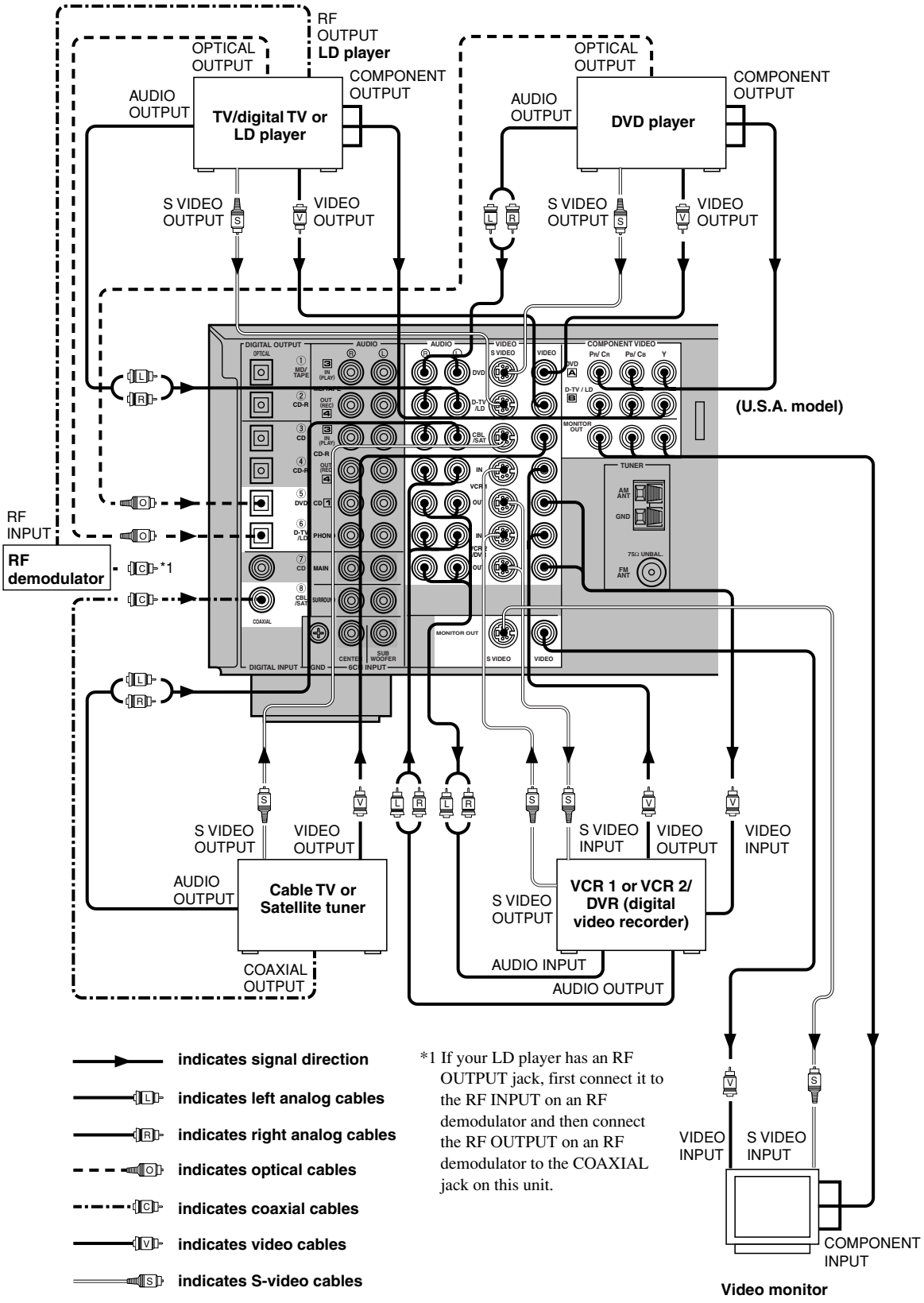
- Use a commercially available S-video cable when connecting to the S VIDEO jack, and commercially available video cables when connecting to the COMPONENT VIDEO jacks.
- When you are using the COMPONENT VIDEO jacks, check the details in the owner's manual that came with the component being connected.

■ VIDEO AUX jacks (on the front panel)



Game console or camcorder

These jacks are used to connect any video input source such as a game console and a camcorder to this unit.



*1 If your LD player has an RF OUTPUT jack, first connect it to the RF INPUT on an RF demodulator and then connect the RF OUTPUT on an RF demodulator to the COAXIAL jack on this unit.

Connecting Audio Components

■ Connecting to digital jacks

This unit has digital jacks for direct transmission of digital signals through either coaxial or fiber optic cables. You can use the digital jacks to input PCM, Dolby Digital and DTS bitstreams. When you connect components to both the COAXIAL and OPTICAL jacks, priority is given to the input signals from the COAXIAL jack. All digital input jacks are acceptable for 96-kHz sampling digital signals (see page 27 for details).

- You can designate the input for each digital jacks according to your component by using "7 I/O ASSIGNMENT" on the SET MENU (see pages 58 and 59 for details).

Note

- The OPTICAL jacks on this unit conform to the EIA standard. If you use a fiber optic cable that does not conform to this standard, this unit may not function properly.

■ Connecting a turntable

PHONO jacks are for connecting a turntable with an MM or high-output MC cartridge. If you have a turntable with a low-output MC cartridge, use an in-line boosting transformer or MC-head amplifier when connecting to these jacks.

- Connect your turntable to the GND terminal to reduce noise in the signal. However you may hear less noise without the connection to the GND terminal for some record players.

■ Connecting a CD player

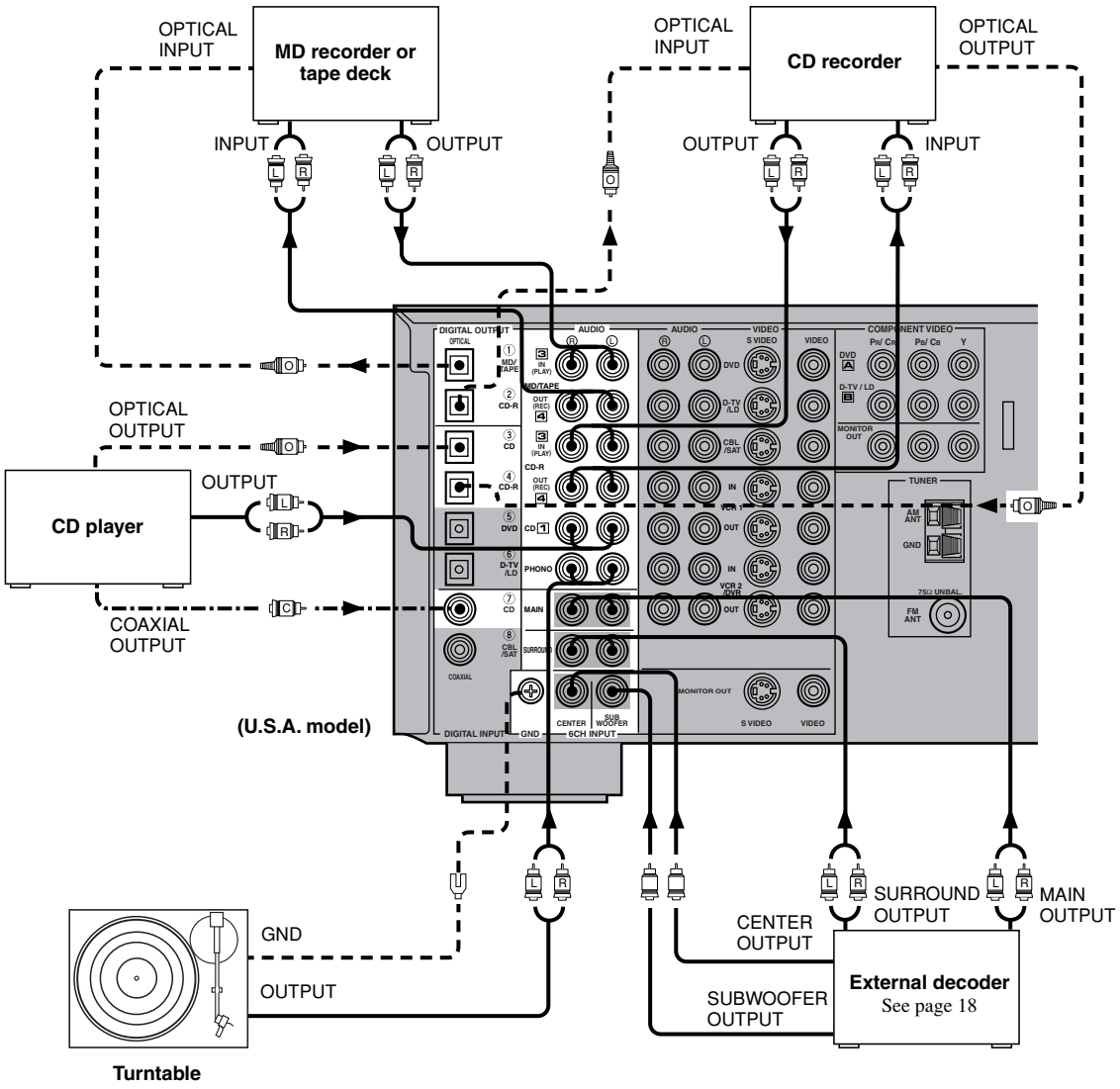
- The COAXIAL CD and OPTICAL CD jacks are available for a CD player which has coaxial or optical digital output jacks.
- When you connect a CD player to both the COAXIAL CD and OPTICAL CD jacks, priority is given to the input signals from the COAXIAL CD jack.

■ Connecting an MD recorder, tape deck or CD recorder

- DIGITAL OUTPUT jacks and analog OUT(REC) are independent. Only digital signals are output from DIGITAL OUTPUT jacks and analog signals from OUT(REC) jacks.
- When you connect your recording component to both the analog and digital input and output jacks, the priority is given to the digital signal.

Notes

- When you connect a recording component to this unit, keep its power on while using this unit. If the power is off, this unit may distort the sound from other components.
- When you record from a source component connected to this unit while this unit is set in the standby mode, the recorded sound may be distorted. To avoid this problem, turn on this unit.



indicates signal direction

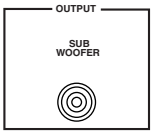
indicates left analog cables

indicates right analog cables

indicates optical cables

indicates coaxial cables

Connecting to a Subwoofer



SUBWOOFER jack

When using a subwoofer with built-in amplifier, including the YAMAHA Active Servo Processing Subwoofer System, connect the input jack of the subwoofer system to this jack. Low bass signals distributed from the main, center and/or rear channels are directed to this jack if they are assigned to this jack. (The cut-off frequency of this jack is 90 Hz.) The LFE (low-frequency effect) signals generated when Dolby Digital or DTS is decoded are also directed if they are assigned to this jack.

Notes

- Adjust the volume level of the subwoofer with the control on the subwoofer. It is also possible to adjust the volume level by using the remote control of this unit (see ADJUSTING THE LEVEL OF THE EFFECT SPEAKERS on page 63).
- Depending on the settings of "1 SPEAKER SET" and "10 LFE LEVEL" on the SET MENU, some signals may not be output from the SUBWOOFER jack.

Connecting an External Decoder

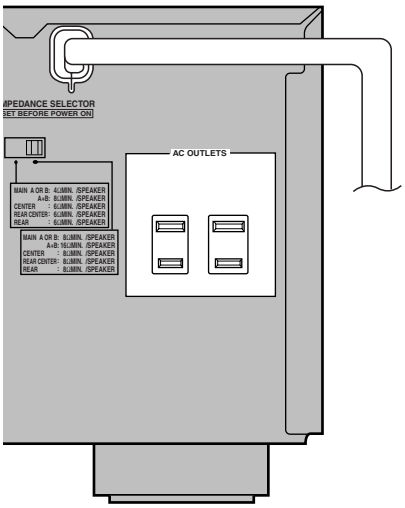
This unit is equipped with 6 additional input jacks (left and right MAIN, CENTER, left and right SURROUND and SUBWOOFER) for discrete multi-channel input from an external decoder, sound processor or pre-amplifier.

Connect the output jacks on your external decoder to the 6CH INPUT jacks. Be sure to match the left and right outputs to the left and right input jacks for the main and surround channels.

Notes

- When you select 6CH INPUT as the input source, this unit automatically turns off the digital sound field processor, and you cannot listen to DSP programs.
- When you select 6CH INPUT as the input source, settings of "1 SPEAKER SET" on the SET MENU do not apply (except for 1F MAIN LEVEL).

Connecting the Power Supply Cords



(U.S.A. model)

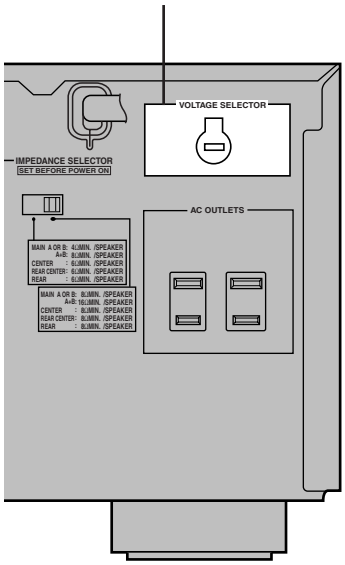
■ Connecting the AC power cord

Plug in this unit to the wall outlet.

■ AC OUTLET(S) (SWITCHED)

U.S.A., Canada and China models ..... 2 OUTLETS
Australia model ..... 1 OUTLET
Use these outlets to connect the power cords from your components to this unit. The power to the AC OUTLET(S) is controlled by this unit's STANDBY/ON (or SYSTEM POWER and STANDBY). These outlets will supply power to any connected component whenever this unit is turned on. The maximum power (total power consumption of components) that can be connected to the AC OUTLET(S) is 80 W.

VOLTAGE SELECTOR



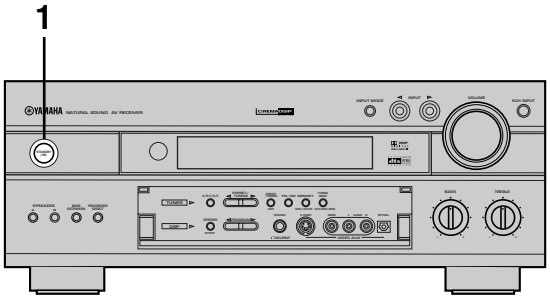
(China model only)

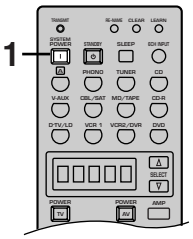
■ VOLTAGE SELECTOR (China model only)

The VOLTAGE SELECTOR on the rear panel of this unit must be set for your local main voltage BEFORE plugging into the AC main supply. Voltages are 110/120/220/240 V AC, 50/60 Hz.

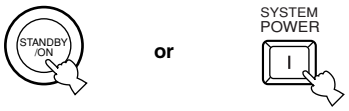
Turning on the Power

When all connections are completed, turn on the power of this unit.





1 Press STANDBY/ON (SYSTEM POWER on the remote control) to turn on the power of this unit.



Front panel **Remote control**

The level of the main volume, and then the current DSP program name appear on the front panel display.

2 Turn on the video monitor connected to this unit.

Same information as above appears on the video monitor.

ON-SCREEN DISPLAY (OSD)

You can display the operation information for this unit on a video monitor. If you display the SET MENU and DSP program parameter settings on a monitor, it is much easier to see the available options and parameters than it is by reading this information on the front panel display.

- If a video source is being reproduced, the OSD is superimposed over the image.
- The OSD signal is not output to the REC OUT jack, and will not be recorded with any video signal.
- You can set the OSD to turn on (blue background) or off when a video source is not being reproduced (or the source component is turned off) by using "13 DISPLAY SET" on the SET MENU (see page 62).

OSD Modes

You can change the amount of information the OSD shows.

Full display

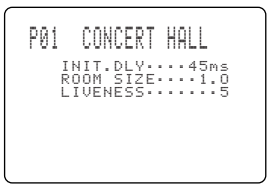
This mode always shows the DSP program parameter settings on the video monitor (see page 66).

Short display

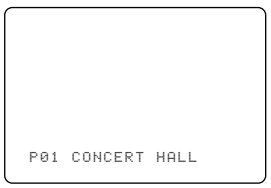
This mode briefly shows the same contents as the front panel display at the bottom of the screen and then disappears.

Display off

This mode briefly shows the "DISPLAY OFF" message at the bottom of the screen and then disappears. Afterwards, no changes to operations appear on the monitor except those of the ON SCREEN button.



Full display



Short display

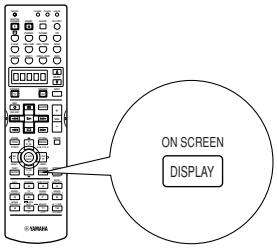
- When you choose the full display mode, INPUT ◁ / ▷, VOLUME and some other types of operation information are displayed at the bottom of the screen in the same format as that for the front panel display.
- The SET MENU and test tone display appear regardless of the OSD mode.

Selecting the OSD Mode

1 Turn on the video monitor connected to this unit.

2 Make sure the AMP mode is selected and press ON SCREEN on the remote control repeatedly to change the display mode.

The OSD mode changes in the following order: full display, short display, and display off.



Notes

- If you choose a video input source that has a component connected to both the S VIDEO IN and composite VIDEO IN jacks, and both the S VIDEO OUT and composite VIDEO OUT jacks are connected to a video monitor, the video signal is output to both the S VIDEO OUT and VIDEO OUT jacks. However, the OSD is carried only on the S-video signal. If no video signal is input, the OSD is carried on both the S-video and composite video signals.
- If your video monitor is connected only to the COMPONENT VIDEO jacks of this unit, the OSD is not shown. Make sure to connect your video monitor to the COMPONENT VIDEO jacks and either VIDEO or S VIDEO jacks if you want to see the OSD.
- Playing back video software that has an anti-copy signal or video signals with a lot of noise may produce unstable images.

SPEAKER MODE SETTINGS

This unit has 6 SPEAKER SET items on the SET MENU that you must set according to the number of speakers in your configuration and their size. The following table summarizes these SPEAKER SET items, and shows the initial settings as well as other possible settings.

Summary of SPEAKER SET Items 1A through 1F

Item	Description	Control value (default setting indicated in bold)
1A CENTER SP	Selects the output mode according to whether or not a center speaker is being used and its performance.	**LRG**/SML/NONE
1B MAIN SP	Selects the output mode according to the performance of the main speakers.	**LARGE**/SMALL
1C REAR L/R SP	Selects the output mode according to whether or not rear L/R speakers are being used and their performance.	**LRG**/SML/NONE
1D REAR CT SP	Selects the Rear Center channel output according to the size of the Rear Center speaker.	**LRG**/SML/NONE
1E LFE/BASS OUT	Selects the speaker according to use for LFE signal output and low bass signal.	SWFR/MAIN/**BOTH**
1F MAIN LEVEL	Selects the main speaker level.	**Normal**/–10 dB

If the initial settings shown in the above table are not appropriate for your speaker configuration, change settings following the steps described in "1 SPEAKER SET" from page 53 to 56.

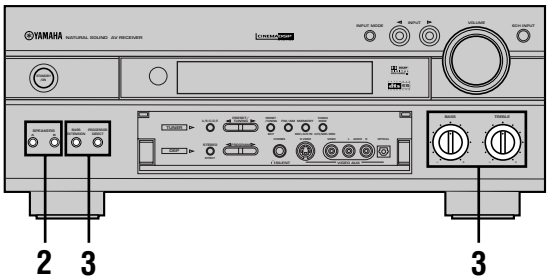
ADJUSTING THE SPEAKER OUTPUT LEVELS

This section explains how to adjust the speaker output levels by using the test tone generator. When this adjustment is made, the output level heard at the listening position will be the same from each speaker. This is important for the best performance of the digital sound field processor, and various decoders (Dolby Digital, Dolby Pro Logic, Dolby Pro Logic II, DTS, DTS ES, and DTS Neo: 6).

Note

- Since this unit cannot enter the test mode while headphones are connected to this unit, be sure to unplug the headphones from the PHONES jack when using the test tone.

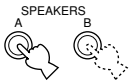
Before You Begin



1 Turn on the video monitor connected to this unit.

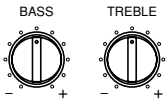
2 Press SPEAKERS A or B to select the main speakers to be used.

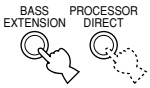
If you are using two sets of the main speakers, press both A and B.



3 Set the BASS and TREBLE controls on the front panel to the center position and turn off BASS EXTENSION and PROCESSOR DIRECT by pressing the buttons.

"BASS EXT. OFF" and "P. DIRECT OFF" appear on the front panel display.

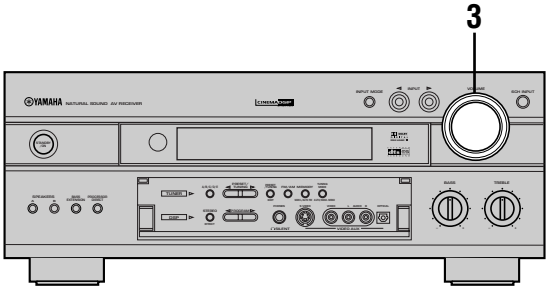


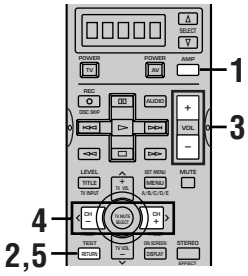


Set to OFF.

Using the Test Tone (TEST DOLBY SUR.)

Use the test tone to balance the output levels of the 6 speakers required for a surround sound system. The adjustment of each speaker output level should be made at your listening position with the remote control. After completing the adjustments, use VOL +/– at your listening position to check if the adjustments are satisfactory.

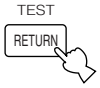




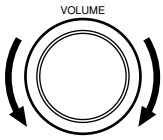
1 Press AMP to select the AMP mode.

AMP appears in the display window on the remote control.

2 Press TEST to output the test tone.

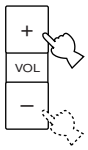


3 Adjust the volume of this unit so you can hear the test tone.

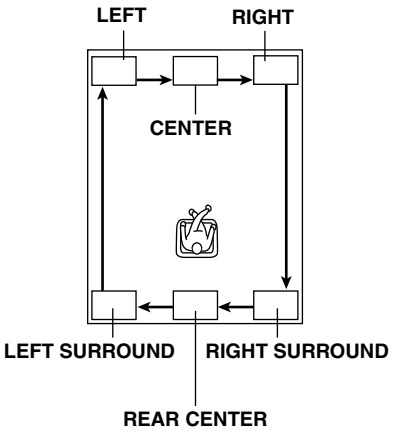


Front panel

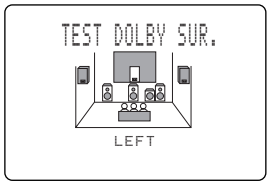
or



Remote control



The test tone is heard from the left main speaker, center speaker, right main speaker, right rear speaker, rear center and left rear speaker in order. The tone is produced for 2.5 seconds each time.
The state of the test tone output is also shown on the monitor by an image of the audio listening room. This is convenient for adjusting each speaker level.

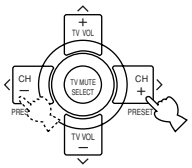


Front panel display also indicates from which speaker the test tone is output in the order of TEST LEFT→TEST CENTER→TEST RIGHT→ TEST R SUR.→TEST REAR CNTR→TEST L SUR.

Note

- If the test tone cannot be heard, turn down the volume, set this unit in the standby mode and check the speaker connections.

4 Adjust the output level of the effect speakers using 〈 / 〉 so the output level coming from the effect speakers is the same as that of the main speakers.



While adjusting, the test tone is heard from the selected speaker.

Note

- The output level of the main speakers cannot be adjusted here.

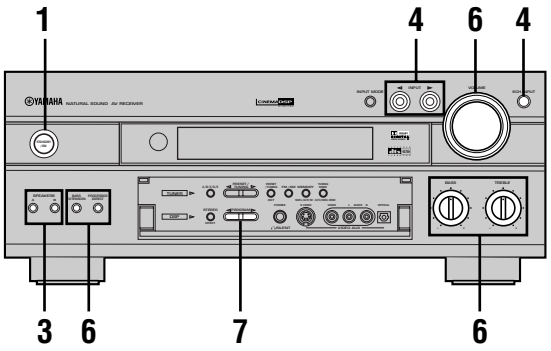
5 When the adjustment is complete, press TEST to stop the test tone.

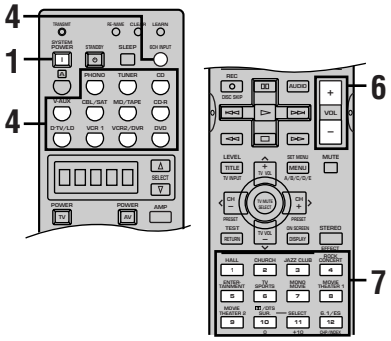
Notes

- The tonal quality of the center speaker can be adjusted by using "5 CENTER GEQ" on the SET MENU (see page 57).
- If "1A CENTER SP" on the SET MENU is set to NONE, the center channel sound is automatically output from the left and right main speakers.
- If "1C REAR L/R SP" on the SET MENU is set to NONE, the output level of the rear right, left and center speakers cannot be adjusted in step 4. The test tone will be circulated in the order of LEFT→CENTER→RIGHT→LEFT..., skipping the rear right and left speakers and the rear center speaker.
- If "1D REAR CT SP" on the SET MENU is set to NONE, the out level of the rear center speaker cannot be adjusted in step 4. The test tone will be circulated in the order of LEFT→CENTER→RIGHT→RIGHT SURROUND→LEFT SURROUND→LEFT ..., skipping the rear center speaker.

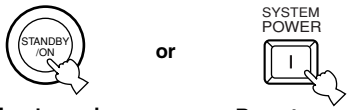
- It is not necessary to readjust the speaker level once it is set as long as you do not change the speakers. You can enjoy listening to or watching the input source with the desired volume by adjusting the volume key.
- You can increase the output levels of the effect speakers (center, left rear and right rear and rear center) to +10 dB. If the output level of these speakers is lower than that of the main speakers even after you have increased the output level of these speakers up to +10 dB, set "1F MAIN LEVEL" on the SET MENU to –10 dB (see page 56). This setting decreases the main speaker output level to about one-third of the normal level. After you have set "1F MAIN LEVEL" on the SET MENU to –10 dB, adjust the levels for the center and rear speakers again.

BASIC PLAYBACK



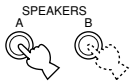


1 **Press STANDBY/ON (SYSTEM POWER on the remote control) to turn on the power.**



2 **Turn on the video monitor connected to this unit.**

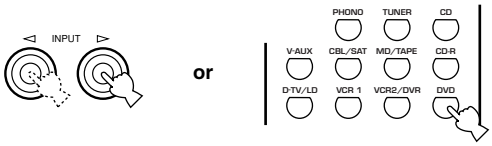
3 **Press SPEAKERS A or B to select the main speakers to be used.**

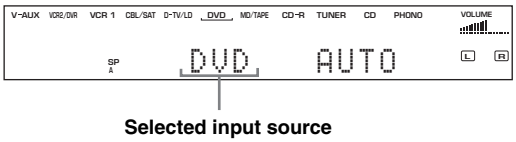


If you are using two sets of main speakers, press both A and B. The speaker indicator(s) for the selected set(s) lights up on the front panel display.

4 **Press INPUT ⊲ / ⊳ repeatedly (one of the input selector buttons on the remote control) to select the input source.**

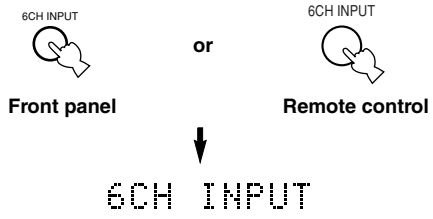
- The current input source name lights up on the front panel display.
- The current input source name and input mode appear on the front panel display and on the video monitor for a few seconds.





To select a source connected to the 6CH INPUT jacks

Press 6CH INPUT until "6CH INPUT" appears on the front panel display and on the video monitor.



Notes

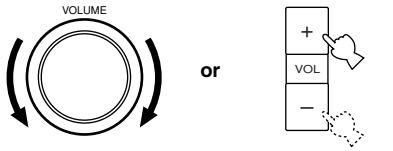
- If "6CH INPUT" is shown on the front panel display and on the video monitor, no other source can be played. To select another input source with INPUT ⊲ / ⊳ (or the input selector buttons), press 6CH INPUT to turn off "6CH INPUT" from the front panel display and the video monitor.
- If you want to enjoy an audio source connected to the 6CH INPUT jacks together with a video source, first select the video source and then press 6CH INPUT.

5 **Start playback or select a broadcast station on the source component.**

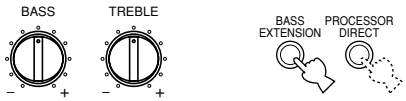
Refer to the operation instructions for the component.

6 **Adjust the volume to the desired output level.**

If desired, use BASS, TREBLE and BASS EXTENSION etc. These controls are only effective for sound from the main speakers.



Front panel Remote control

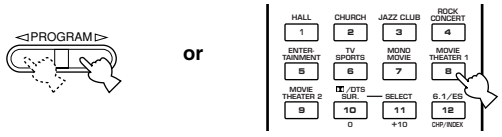


Note

- If the component connected to the VCR 1 OUT, VCR 2/DVR OUT, CD-R OUT and MD/TAPE OUT jacks is turned off, the reproduced sound may be distorted or the volume may be lowered for the characteristics of AV receivers. In this case, turn on the component.

7 **Select a DSP program if desired.**

Use PROGRAM ⊲ / ⊳ (DSP program buttons on the remote control) to select a DSP program. See pages 28 to 35 for details about the DSP program.

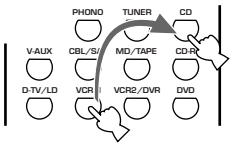


Front panel Remote control

■ BGV (background video) function

The BGV function allows you to combine a video image from a video source with a sound from an audio source. For example, you can enjoy listening to classical music while having beautiful scenery from the video source on the video monitor.

Select a source from the video group and then select a source from the audio group with the input selector buttons on the remote control. This selection for BGV cannot be made with INPUT ⊲ / ⊳ on the front panel.



■ To mute the sound

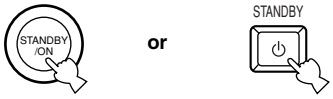
Press MUTE on the remote control.

To resume the audio output, press MUTE again.

- You can also cancel mute to press any operation buttons such as VOL +/–.
- During muting, the "MUTE" indicator flashes on the front panel display and "MUTE ON" appears on the front panel display for a few seconds.

■ When you have finished using this unit

Press STANDBY/ON (STANDBY on the remote control) to set this unit in the standby mode.



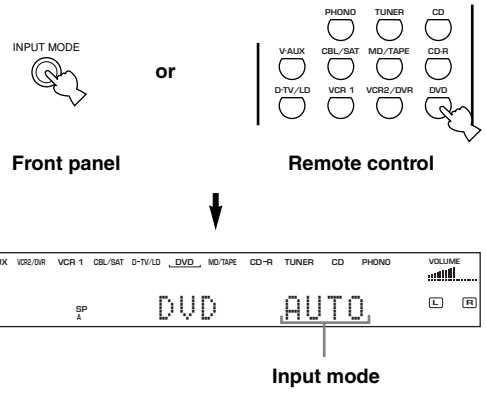
Front panel Remote control

Input Modes and Indications

This unit comes with various input jacks. You can set the priority of the input signal among different types of input signals.

When you turn on the power of this unit, the input mode is set according to "8 INPUT MODE" on the SET MENU (see page 59 for details).

Press INPUT MODE (the input selector button that you have pressed to select the input source on the remote control) repeatedly until the desired input mode is shown on the front panel display and on the video monitor.



AUTO: In this mode, the input signal is automatically selected in the following order:
1) Dolby Digital or DTS signal
2) Digital (PCM) signal
3) Analog signal

DTS: In this mode, only the digital input signal encoded with DTS is selected even if another signal is input at the same time.

ANALOG: In this mode, only the analog input signal is selected even if a digital signal is input at the same time.

Notes

- If digital signals are input from both the COAXIAL and OPTICAL jacks, the digital signal from the COAXIAL jack has precedence over the OPTICAL jack.
- When AUTO is selected, this unit automatically determines the type of signal. If this unit detects a Dolby Digital or DTS signal, the decoder automatically switches to the appropriate setting and reproduces 6.1 channel source.
- In playing the disc encoded with Dolby Digital or DTS on some LD or DVD players, the sound output delays for a moment when playback resumes after a search because the digital signal is selected again.
- When playing the LD source that has not been digitally recorded, the sound may not be output for some LD players. In this case, set the input mode to ANALOG.

■ Notes on the digital signal

The digital input jacks of this unit can also handle 96-kHz sampling digital signals. (To utilize this, use a source that supports 96-kHz sampling digital signals and set the player for digital output. Refer to the operation instructions for the player.) Note the following when a 96-kHz sampling digital signal is input to this unit:

– DSP programs cannot be selected. Sound will be output as normal 2-channel stereo sound from only the left and right main speakers.

Note

- If "1B MAIN SP" on the SET MENU is set to SMALL and "1E LFE/BASS OUT" is set to SWFR, or "1E LFE/BASS OUT" is set to BOTH, the sound is also output from the subwoofer.

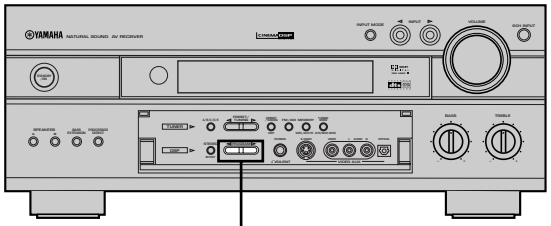
– "Adjusting the output level of the effect speakers" described on page 63 cannot be made.

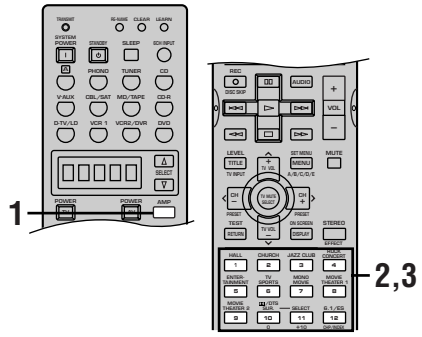
■ Notes on playing DTS-CD/LDs

- If the digital output data of the player has been processed in any way, you may not be able to perform DTS decoding even if you make a digital connection between this unit and the player.
- If you play a source encoded with a DTS signal and set the input mode to ANALOG, this unit reproduces the noise of an unprocessed DTS signal. When you want to play a DTS source, be sure to connect the source to a digital input jack and set the input mode to AUTO or DTS.
- If you switch the input mode to ANALOG while playing a source encoded with a DTS signal, this unit reproduces no sound.
- If you play a source encoded with a DTS signal with the input mode set to AUTO;
  – This unit automatically switches to the DTS-decoding mode (The "dts" indicator lights up.) after having detected the DTS signal. When playback of the DTS source is completed, the "dts" indicator may flash. While this indicator is flashing, only DTS source can be played. If you want to play a normal PCM source soon, set the input mode back to AUTO.
  – The "dts" indicator may flash when a search or skip operation is performed while the DTS source is playing back with the input mode set to AUTO. If this status continues for longer than 30 seconds, this unit will automatically switch from "DTS-decoding" mode to PCM digital signal input mode. The "dts" indicator will turn off.

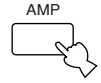
Selecting a Sound Field Program

You can enhance your listening experience by selecting a DSP program. There are 10 programs with sub-programs available with this unit. However the selection depends on the input signal format and not all the sub-programs are possible for all input signal formats. For details about each program, see pages 31 to 35.



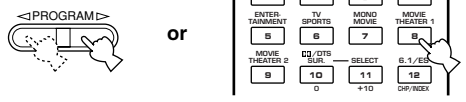


1 Press AMP to select the AMP mode.

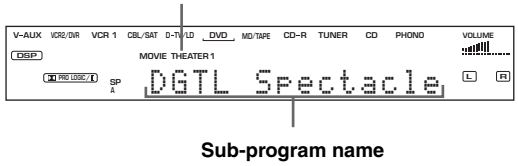


2 Press PROGRAM ◁ / ▷ (one of the numeric buttons on the remote control) to select the desired program.

The name of the selected program appears on the front panel display and on the video monitor.

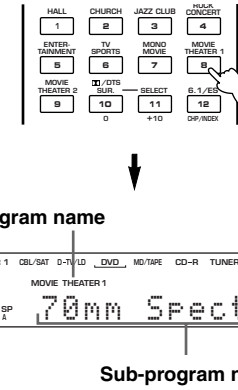


Front panel Remote control



3 After selecting the desired program, press the same button repeatedly to select the desired sub-program if available.

For example, to select the sub-program "70 mm Spectacle", press MOVIE THEATER 1 repeatedly.

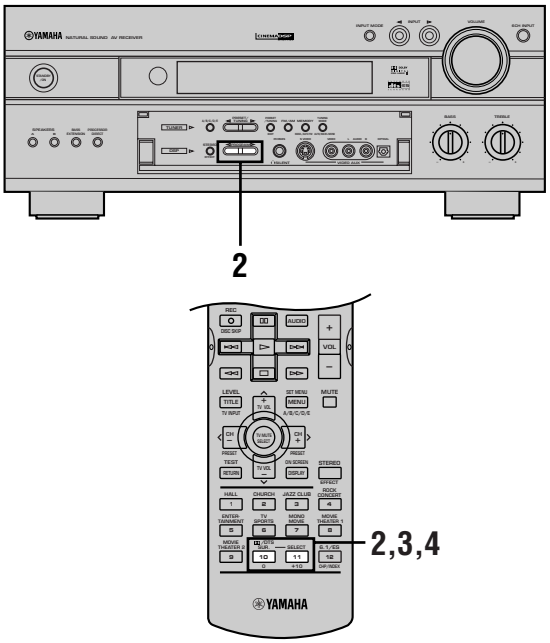


Notes

- Choose a DSP program based on your listening preference, and not on the name of the program. The acoustics of your listening room affect the DSP program. Minimize the sound reflections in your room to maximize the effect created by the program.
- When you select an input source, this unit automatically selects the last DSP program used with that source.
- When you set this unit in the standby mode, the current source and DSP program are memorized and are automatically selected when you turn on the power again.
- If a Dolby Digital or DTS signal is input when the input mode is set to AUTO, the DSP program (No. 8–10) automatically switches to the appropriate decoding program.
- When a monaural source is being played with PRO LOGIC/ Normal or PRO LOGIC/Enhanced, PRO LOGIC II Moive, or Neo: 6 Cinema, no sound will be heard from the main speakers and the rear speakers. Sound can only be heard from the center speaker. However, if "1A CENTER SP" on the SET MENU is set to NONE, the center channel sound is output from the main speakers.
- When a source connected to the 6CH INPUT jacks of this unit is selected, the digital sound field processor cannot be used.
- When 96-kHz sampling digital signals are input to this unit, the DSP program cannot be selected. In this case, the sound is reproduced as normal 2-channel stereo.

Selecting PRO LOGIC Ⅱ or Neo: 6

You can enjoy the 2-channel sources decoded into five or six discrete channels by selecting PRO LOGIC Ⅱ or Neo: 6 in the program No. 10.



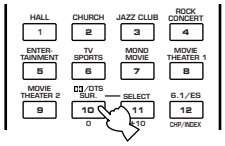
1 Select a 2-channel source and start playback on the source component.

2 Select PRO LOGIC Ⅱ (Movie/Music) or Neo: 6 (Cinema/Music) by pressing PROGRAM ◁ / ▷ on the front panel.

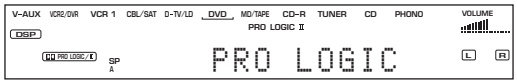
Front control

or

Select PRO LOGIC by pressing the numeric button 10 on the remote control.



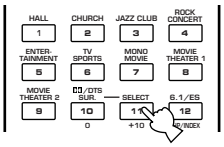
Remote control



(For remote control only)

3 Press the numeric button 11 repeatedly to select the decoder; PRO LOGIC, PRO LOGIC Ⅱ or Neo: 6.

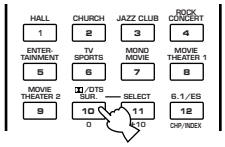
The decoder selection switches from PRO LOGIC Ⅱ to Neo: 6 and then returns to PRO LOGIC Ⅱ on the front panel display.



4 After deciding on the decoder (PRO LOGIC Ⅱ or Neo: 6), select the mode to suit the source by pressing the numeric button 10.

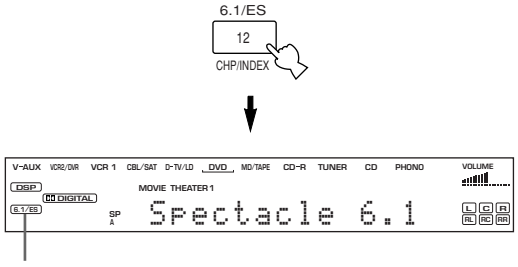
The selection switches as follow;
PRO LOGIC Ⅱ Movie ↔ PRO LOGIC Ⅱ Music
(when PRO LOGIC Ⅱ is selected)

Neo: 6 Cinema ↔ Neo: 6 Music
(when Neo: 6 is selected)



■ Playing the Dolby Digital Matrix 6.1 or DTS ES software

Press 6.1/ES to turn on the Dolby Digital Matrix 6.1 or DTS ES decoder to listen to the Dolby Digital Matrix 6.1 and DTS ES software with a rear center speaker.



The " 6.1/ES " indicator lights up.

The display changes AUTO → Disc6.1 → Mtrx6.1 → OFF each time the ES/6.1 button is pressed.

Notes

- No sound will be output from the rear center speaker if you have set "1C REAR L/R SP" on the SET MENU to NONE.
- The rear center speaker can be used when playing a 5.1-channel source also.

AUTO: This mode automatically switches Dolby Digital Matrix 6.1/DTS ES Matrix 6.1/DTS ES Discrete 6.1 depending on the signal in the input source that this unit can detect. Rear center speaker does not work for 5.1 channel sources.

Disc6.1: This mode can be selected only when the source with DTS ES Discrete format has been detected.

Mtrx6.1: This mode makes 6-channel playback of the input source through the Matrix 6.1 decoder.

OFF: Rear center speaker does not work in this mode.

■ Virtual CINEMA DSP and SILENT CINEMA DSP

Virtual CINEMA DSP

With the Virtual CINEMA DSP, you can enjoy all the DSP programs without rear speakers. It creates the virtual speakers to reproduce the natural sound field.
The sound field processing is changed to the Virtual CINEMA DSP mode according to the selected DSP program by setting "1C REAR L/R SP" on the SET MENU to NONE.

Note

- This unit is not set in the virtual CINEMA DSP mode even if "1C REAR L/R SP" is set to NONE in the following cases:
  – when the 6ch Stereo, DOLBY DIGITAL Normal, Pro Logic II, DTS Normal or Neo: 6 program is selected;
  – when the sound effect is turned off;
  – when 6CH INPUT is selected as the input source;
  – when 96-kHz sampling digital signals are input to this unit;
  – when using the test tone; or
  – when connecting the headphones.

SILENT CINEMA DSP

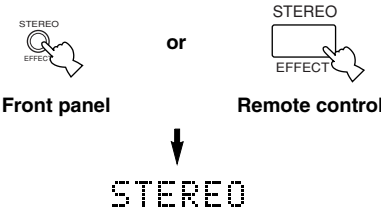
You can enjoy the powerful sound field as if there were actual speakers with the SILENT CINEMA DSP. You can listen to SILENT CINEMA DSP by connecting your headphones to the PHONES jack while the digital sound field processor is on. Enjoy all the DSP program using the headphones. The "SILENT" indicator lights up on the front panel display. (If the sound effect is off, you listen to the source with normal stereo reproduction.)

Note

- This unit is not set in the SILENT CINEMA DSP mode even if the sound effect is on;
  – when 96-kHz sampling digital signals are input to this unit.

■ Normal Stereo Reproduction

Press STEREO to turn off the sound effect for normal stereo reproduction.
Press STEREO again to turn the sound effect back on.



Notes

- If you turn off the sound effect, no sound is output from the center speaker, rear speakers, rear center speaker and subwoofer.
- If you turn off the sound effect while a Dolby Digital or DTS signal is being output, the dynamic range of the signal is automatically compressed and the sounds of the center and rear speaker channels are mixed and output from the main speakers.
- The volume may be greatly reduced when you turn off the sound effect or if you set "11 D-RANGE" on the SET MENU to MIN. In this case turn on the sound effect.

■ Displaying the information about the input source

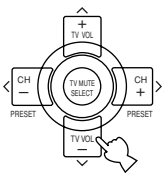
You can display the information such as the type, format and sampling frequency of the signal input from the component connected to this unit.

1 Select the input source you want to obtain the information about by pressing an input selector button.

2 Press AMP to select the AMP mode.

3 Press STEREO to light STEREO.

4 Press ∨ to display the information about the input signal.



DIGITAL SOUND FIELD PROCESSING (DSP)

Understanding Sound Fields

A sound field is defined as the "characteristic sound reflections of a particular space." In concert halls and other music venues, we hear early reflections and reverberations as well as the direct sound produced by the artist(s). The variations in the early reflections and other reverberations among the different music venues is what gives each venue its special and recognizable sound quality.
YAMAHA sent teams of sound engineers all around the world to measure the sound reflections of famous concert halls and music venues, and collect detailed sound field information such as the direction, strength, range, and delay time of those reflections. Then we stored this enormous amount of data in the ROM chips of this unit.

■ Recreating a sound field

Recreating the sound field of a concert hall or an opera house requires localizing the virtual sound sources in your listening room. The traditional stereo system that uses only two speakers is not capable of recreating a realistic sound field. YAMAHA's DSP requires four effect speakers to recreate sound fields based on the measured sound field data. The processor controls the strength and delay time of the signals output from the four effect speakers to localize the virtual sound sources in a full circle around the listener.

Hi-Fi DSP Programs

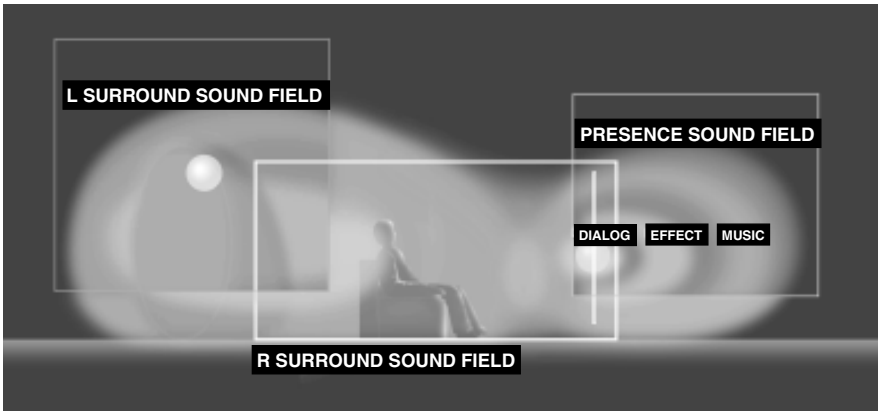
The following list gives you a brief description of the sound fields produced by each of the DSP programs. Keep in mind that most of these are precise digital recreations of actual acoustic environments.

No.	Program	Features
1	**CONCERT HALL**	A large round concert hall with a rich surround effect. Pronounced reflections from all directions emphasize the extension of sounds. The sound field has a great deal of presence, and your virtual seat is near the center, close to the stage.
2	**CHURCH**	This program recreates the acoustic environment of a big church with a high dome and columns along each side. The reverberation delay is very long while the early reflections are smaller than with other sound field programs.
3	**JAZZ CLUB**	This is the sound field at stage front in "The Bottom Line", a famous New York jazz club. The floor can seat 300 people to the left and right in a sound field offering a real and vibrant sound.
4	**ROCK CONCERT**	The ideal program for lively, dynamic rock music. The data for this program was recorded at LA's "hottest" rock club. The listener's virtual seat is at the center-left of the hall.
5	**ENTERTAINMENT/ Disco**	This program recreates the acoustic environment of a lively disco in the heart of a big city. The sound is dense and highly concentrated. It is also characterized by a high-energy, "immediate" sound.
	ENTERTAINMENT/ 6ch Stereo	Using this program increases the listening position range. This is a sound field suitable for background music at parties.

CINEMA-DSP

Sound Design of CINEMA-DSP

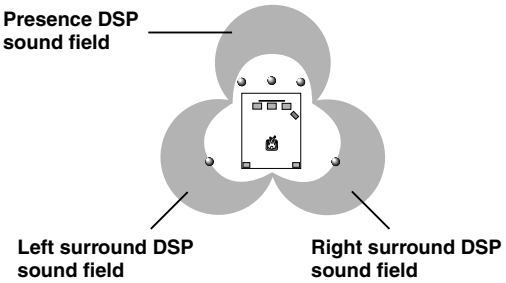
Filmmakers intend the dialog to be located right on the screen, the effect sound a little farther back, the music spread even farther back, and the surround sound around the listener. Of course, all of these sounds must be synchronized with the images on the screen.
CINEMA-DSP is an upgraded version of YAMAHA DSP specially designed for movie soundtracks. CINEMA-DSP integrates the DTS, Dolby Digital, and Dolby Pro Logic surround sound technologies with YAMAHA DSP sound field programs to provide the surround sound field. It recreates the most complete movie sound design in your audio room. In CINEMA-DSP sound field programs, YAMAHA's exclusive DSP processing is added to the right and left Main and Center channels, so the listener can enjoy realistic dialogue, depth of sound, smooth transition between sound sources, and a surround sound field that goes beyond the screen.
When a DTS or Dolby Digital signal is detected, the CINEMA-DSP sound field processor automatically chooses the most suitable sound field program for that signal.



In addition to the DSP, this unit is equipped with various precise decoders; Dolby Pro Logic/Pro Logic II/DTS Neo: 6 decoder for 2-channel sources, Dolby Digital/DTS decoder for multi-channel sources and Dolby Digital Matrix 6.1 or DTS ES decoder for a rear center channel. You can select the CINEMA-DSP program to optimize these decoders and the DSP sound patterns depending on the input source.

The 6-channel soundtracks found on 70-mm film produce precise sound field localization and rich, deep sound without using matrix processing. This unit's MOVIE THEATER programs provide the same quality of sound and sound localization that 6-channel soundtracks do. The built-in Dolby Digital or DTS decoder brings the professional-quality sound designed for movie theaters into your home. With this unit's MOVIE THEATER programs, you can recreate a dynamic sound that gives you the feeling of being at a public theater in your listening room by using Dolby Digital or DTS technology.

■ Dolby Digital/DTS + DSP sound field effect

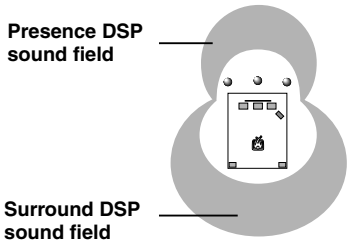


These programs use YAMAHA's tri-field DSP processing on each of the Dolby Digital or DTS signals for the front, left surround and right surround channels. This processing enables this unit to reproduce the immense sound field and surround expression of a Dolby Digital- or DTS-equipped movie theater without sacrificing the clear separation of all channels.

■ Dolby Digital Matrix 6.1/DTS ES + DSP sound field effect

These programs provide you with the maximum experience of the spacious surround effects since an extra rear center DSP sound field created from the rear center channel is added.

■ Dolby Pro Logic + DSP sound field effect



Most movie software has 4-channel (left, center, right and surround) sound information encoded by Dolby Surround matrix processing and stored on the left and right tracks. These signals are processed by the Dolby Pro Logic decoder. The MOVIE THEATER programs are designed to recreate the spaciousness and delicate nuances of sound that tend to be lost in the encoding and decoding processes.

■ Dolby Pro Logic Ⅱ /DTS Neo: 6

Dolby Pro Logic Ⅱ and DTS Neo: 6 equipped on this unit decode the 2-channel Dolby Surround software into five discrete full-range channels (3 channels in front and 2 or 3 channels in rear). They also provide two modes; MOVIE/CINEMA for movies and MUSIC for 2-channel source.

CINEMA-DSP Programs

■ For moive programs: No. 8 to 10

According to the input signal format, this unit automatically chooses the appropriate decoder and DSP sound field pattern.

Table of Program Names for Each Input Format

No.	Program \ Input	2 channel	5.1 channel		6.1 channel *1	
		Stereo	DOLBY DIGITAL	DTS	DOLBY DIGITAL	DTS ES
8	MOVIE THEATER 1	70 mm Spectacle	DGTL Spectacle	DTS Spectacle	Spectacle 6.1	Spectacle ES
		70 mm Sci-Fi	DGTL Sci-Fi	DTS Sci-Fi	Sci-Fi 6.1	Sci-Fi ES
9	MOVIE THEATER 2	70 mm Adventure	DGTL Adventure	DTS Adventure	Adventure 6.1	Adventure ES
		70 mm General	DGTL General	DTS General	General 6.1	General ES
10	DOLBY DIGITAL	—	Normal	—	Matrix 6.1	—
		—	Enhanced	—	Enhanced 6.1	—
	DTS DIGITAL SUR	—	—	Normal	—	ES Matrix 6.1 ES Discrete 6.1 *2
		—	—	Enhanced	—	Enhanced ES
	PRO LOGIC	Normal	—	—	—	—
		Enhanced	—	—	—	—
	PRO LOGIC II	Movie	—	—	—	—
		Music	—	—	—	—
	DTS Neo: 6	Cinema	—	—	—	—
		Music	—	—	—	—

*1 means the 6.1 /ES Matrix decoder is ON.
*2 means the DTS ES software encoded with Discrete 6.1 is input.

- If a Dolby Digital signal or DTS signal is input when the input mode is set to AUTO, the DSP program will be automatically switched to the Dolby Digital playback sound field or DTS playback sound field.
- If Dolby Digital Surround EX software or DTS ES software is played when AUTO is selected by pressing the 6.1/ES button on the remote control, the Dolby Digital Matrix 6.1 or DTS ES decoder will automatically turn on and the corresponding DSP program will be selected.
- 6.1/ES on the remote control can be used to play Dolby Digital or DTS 5.1 channel sources with rear center speaker. In this case the program name changes to the corresponding name for 6.1 channel.
- When playing 6.1 channel source with 6.1/ES on the remote control off, the program name changes to the corresponding name for 5.1 channel.

Note

- The " DSP " indicator does not light up when selecting the program No. 10 except for the Enhanced mode.

The following list gives you a brief description of the sound fields produced by each of the DSP programs. Keep in mind that most of these are precise digital recreations of actual acoustic environments.

Note

• Select the DSP program that you feel sounds best regardless of the name and description given for it below.

No.	Program		Features
8	MOVIE THEATER 1	Spectacle	This program creates the extremely wide sound field of a 70-mm movie theater. It precisely reproduces the source sound in detail, making both the video and the sound field incredibly real. This is ideal for any kind of video source encoded with Dolby Surround, Dolby Digital or DTS (especially large-scale movie productions).
		Sci-Fi	This program clearly reproduces dialog and sound effects in the latest sound form of science fiction films, thus creating a broad and expansive cinematic space amid the silence. You can enjoy science fiction films in a virtual-space sound field that includes Dolby Surround, Dolby Digital and DTS-encoded software employing the most advanced techniques.
9	MOVIE THEATER 2	Adventure	This program is ideal for precisely reproducing the sound design of the newest 70-mm and multichannel soundtrack films. The sound field is made to be similar to that of the newest movie theaters, so the reverberations of the sound field itself are restrained as much as possible.
		General	This program is for reproducing sounds from 70-mm and multichannel soundtrack films, and is characterized by a soft and extensive sound field. The presence sound field is relatively narrow. It spatially spreads all around and toward the screen, restraining the echo effect of conversations without losing clarity.
10	Enhanced Mode		This program ideally simulates the multi-surround speaker systems of the 35-mm film theaters. Dolby Pro Logic decoding, Dolby Digital decoding or DTS decoding and digital sound field processing create precise effects without altering the original sound orientation. The surround effects produced by this sound field wrap around the viewer naturally from the back to the left and right, and toward the screen.

■ For audio-video sources in 2-channel: No. 5 to 7

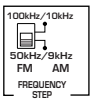
No.	Program	Features
5	ENTERTAINMENT/ Game	This program adds a deep and spatial feeling to video game sounds.
6	TV SPORTS	With this program, you can enjoy watching various TV programs such as news, variety shows, music programs or sports programs. In a stereo broadcast of a sports game, the commentator is oriented at the center position, and the shouts and the atmosphere in the stadium spread on the surround side, while their spread to the rear is properly restrained.
7	MONO MOVIE	This program is provided for reproducing monaural video sources (such as old movies). The program produces the optimum reverberation to create sound depth by using only the presence sound field.

Connecting the Antennas

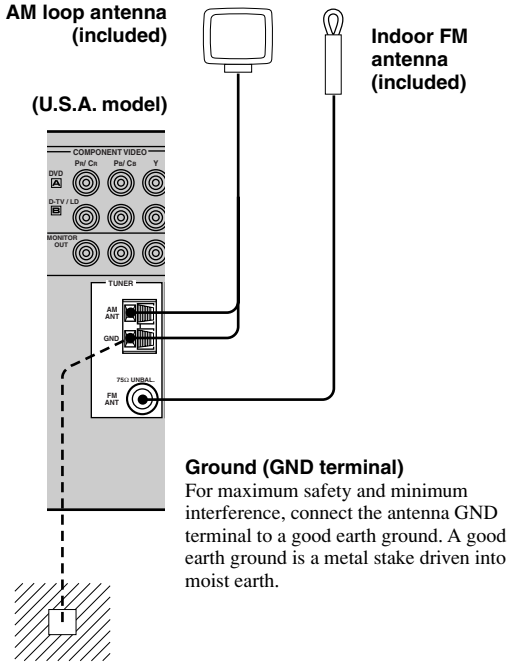
Both AM and FM indoor antennas are included with this unit. In general, these antennas should provide sufficient signal strength.

Connect each antenna correctly to the designated terminals.

FREQUENCY STEP switch (China model only)



Because the interstation frequency spacing differs in different areas, set the FREQUENCY STEP switch (locating on the rear panel) according to the frequency spacing in your area.
North, Central and South America:
100 kHz/10 kHz
Other area: 50 kHz/9 kHz
Before setting this switch, disconnect the AC power plug of this unit from the AC outlet.



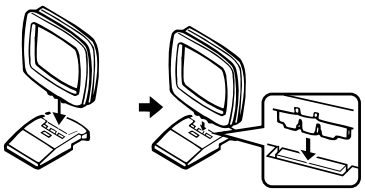
Ground (GND terminal)
For maximum safety and minimum interference, connect the antenna GND terminal to a good earth ground. A good earth ground is a metal stake driven into moist earth.

■ Connecting the indoor FM antenna

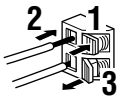
Connect the included indoor FM antenna to the 75Ω UNBAL. FM ANT terminal.

■ Connecting the AM loop antenna

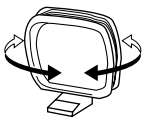
1 **Set up the AM loop antenna, then connect it.**



2 **Press and hold the tab to insert the AM loop antenna lead wires into the AM ANT and GND terminals.**



3 **Orient the AM loop antenna for the beat reception.**



- The AM loop antenna can be removed from the stand and attached to a wall, etc.

Notes

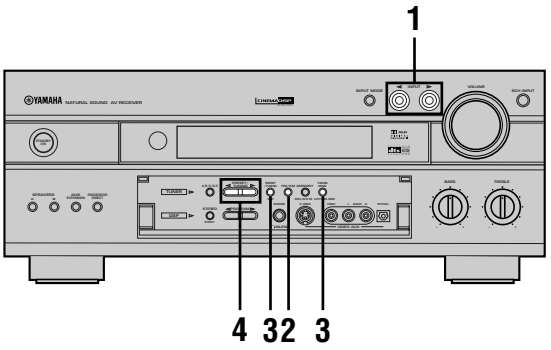
- The AM loop antenna should be placed away from this unit.
- The AM loop antenna should always be connected, even if an outdoor AM antenna is connected to this unit.

A properly installed outdoor antenna provides clearer reception than an indoor one. If you experience poor reception quality, an outdoor antenna may improve the quality. Consult the nearest authorized YAMAHA dealer or service center about the outdoor antennas.

Automatic and Manual Tuning

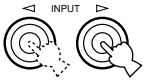
There are 2 ways of tuning; automatic and manual. Automatic tuning is effective when station signals are strong and there is no interference.

When using the remote control to proceed some of the steps in "TUNING", make sure the "TUNER" mode is selected.



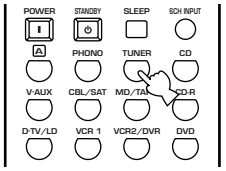
■ Automatic tuning

1 Press INPUT ◁ / ▷ (TUNER on the remote control) to select TUNER as the input source.



Front panel

or



Remote control

2 Press FM/AM to select the reception band.

"FM" or "AM" appears on the front panel display.

→ FM or AM

3 Press TUNING MODE (AUTO/MAN'L MONO) so that the "AUTO" indicator lights up on the front panel display.

→ AUTO

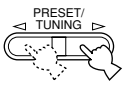
Lights up

If the colon (:) appears on the front panel display next to the band indication, press PRESET/TUNING EDIT to turn it off.

→

4 Press PRESET/TUNING ◁ / ▷ once to begin automatic tuning.

Press ▷ to tune in to a higher frequency, or press ◁ to tune in to a lower frequency. Press the same button again if the tuning search does not stop at the desired station.



→

When tuned in to a station, the "TUNED" indicator lights up and the frequency of the received station is shown on the front panel display.

- Use the manual tuning method if the tuning search does not stop at the desired station because the signal is weak.

■ Manual tuning

If the signal from the station you want to select is weak, you must tune in to it manually.

1 Select TUNER and the reception band following steps 1 and 2 described in "Automatic tuning" on left.

2 Press TUNING MODE (AUTO/MAN'L MONO) so that the "AUTO" indicator goes off from the front panel display.

→ AUTO

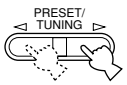
Goes off

If the colon (:) appears on the front panel display next to the band indication, press PRESET/TUNING EDIT to turn it off.

→

3 Press PRESET/TUNING ◁ / ▷ to tune in to the desired station manually.

Hold down the button to continue the tuning search.



Note

- Manually tuning in to an FM station will automatically change the reception mode to monaural to increase the signal quality.